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FLIGHT MODEL PRESHIPMENT REVIEW DATA PACKAGE VOLUME II - SUBSYSTEM DATA PART C

Article IV - 3A

CONTRACT NAS 5-24200

GODDARD SPACE FLIGHT CENTER Greenbelt, Maryland 20771

Prepared for

REMATIC MAPPER

Barbara Research Center) 199 p CSCL 14B G3/43 A09/MF A01

VOLUME 2.

(E83-10260) PRESHIPMENT REVIEW DATA PACKAGE. Final Report (Santa PART C: SUBSYSTEM DATA

THEMATIC MAPPER FLIGHT MODEL

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THEMATIC MAPPER

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FLIGHT MODE!. PRESHIPMENT REVIEW DATA PACKAGE VOLUME II - SUBSYSTEM DATA PART C

SEPT 1982

Article IV - 3A

Preserved for

GODDARD SPACE FLIGHT CENTER Greenbalt, Maryland 20771 CONTRACT NAS 5-24200

THEMATIC MAPPER

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THEMATIC MAPPER

FLIGHT MODEL

PRESHIPMENT REVIEW

VOLUME II

SUBSYSTEMS

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THEMATIC MAPPER

FLIGHT MODEL

PRE SHIPMENT REVIEW

VOLUME II

SUBSYSTEMS

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2.0 Subsystems Acceptance Data

Each of the major subsystems of the Flight Model Thematic Mapper was reviewed as an entity prior to integration into the system. The intent of this section is to present for each major subsystem, acceptance data for the subsystem (test results); reference lists of the configuration status; and reference lists of Non-Conforming Material Reports, Failure Reports (with copies), and Requests for Deviation/Waiver (with copies).

The acceptance data for each subsystem (where applicable) is contained in the Appendix to this report, as referenced in the first subsection for each subsystem.

The second subsection for each subsystem contains a tabular summary of the "as designed" and "as built" configuration lists, showing all applicable drawings, specifications, or standards.

(An "as built" configuration list for the total system is included in Volume I and is also included herein immediately following this page). This is followed by a listing of all items against the subsystem, with copies of NCRM's, RT's, and RD/W's.

SUMMARY
AS-BUILT CONFIGURATION LIST
TM FLIGHT S/N 003

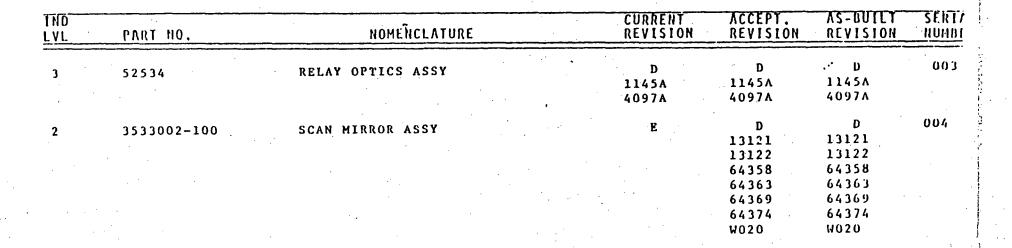
TRD LVL PART NO.	NOMENCLATURE	CURRENT REVISION	ACCEPT. REVISION	AS-BUILT REVISION	SERIAL NUMBER
1 51065	THEMATIC MAPPER ASSY	J	J ·	J	003
		4257A	4257A	4257A	0.00
		4487A	4487A	44871	
		4557A	4557A	4557A	· :
		4573A	4573A	4573A	
		4643A	4643A	4643A	•
		4658A	4658A	4658A	
		D143R1	D143R1	D143R1	
·		D144	D144	D144	Φ Ο.
•	N.	D146	D146	D146	ORIGINAL OF POOR
		D148	D148	D148	T S
		D155	D155	D155	88
		D158	D158	D158	ž (~
	•	D161	D161	D161	PAGE QUALI
		D162	D162	D152	รีล์
•		D163	D163	D163	
		D164	D164	D164	7 5
		D165	D165	D165	
		W166	W166	W166	
•	·	w169	W169	W169	•
		W170 [.]	W170	W170	
		W171R1	W171R1	W171R1	
· .		W173	W173	W173	
2 50840	MAIN FRAME ASSY	E	E	E	003
2 52347	ELECTRONICS MODULE ASSY	. D ·	В	В	201
•		4588A	4091A	4091A	
		• •	4113A	41131	
			4242A	42421	(a .)
•			4293A	4293A	

THD LVL	PART HO.	NOMENCLATURE		CURRENT REVISION	ACCEPT. REVISION	AS-BUILT REVISION	SERT NUMB
3	3533003-100	MULTIPLEXER ASSY	•	. c	С	C	003
	3333003-100	HOLLII BEKEK KOSI	•	43009	43074	43009	·
_	•		•	43074	65661	43074	
•			•	65661	65662	65661	
				65662	W124	65662	,
				W124	W125	W124	
			, Te	W125		W125	
3	50869	POWER SUPPLY ASSY	•	D .	D	D	004
J ,	30809	TOWER SUITE ASSI	,	2015A	2015A	20151	
				2039A	2039A	2039A	
				4347A	4347A	4347A	
		· ·		D030	D030	D030	
				D068	D068	D068	
		•	•	W074	W074	W074	
				W092	W092	W092	
				W093	W093	W093	•
			• .	W101	W101	W101	٠
2	52348	CABLE ROUTING ASSY		F	F	F	005
3	32340	CABLE ROUTING ASSI	•	3844A	3844A	3844A	
_			•	n		n ·	
2	52532	OPTICAL ASSY		F	F	F	003
				3174A	3174A	3174A	• .
				4100A	4100A	4100A	
				4187A	4187A	4187A 4266A C	
				4266A 4488A	4266A 4488A	4488A)) 2
				4455A	4559A	45591	ORIGINAL
			•	4559A 4656A	4656A	4656A C	2 2
				D-151	D-151	D-151	5 F
				D-154	D-154	D-154 C	ס" (
	•			W-148	W-148	W-148	ନ
				4 440	H X-40		m i
3	51512	AFT OPTICS ASSY		E	D	p . ₹	PAGE IS
			4	3646A	3646A	3646A	
•				3925A	3896A	3896A	. ,
•				3959A	3925A	3925A	
				4585A	3959A	39598	•
		•		• ,	4134A	41348	

第二人员的制度的现在分词的特别的企业地的自身组变。

TND	PART NO.	NOMENCLATURE	CURRENT REVISION	ACCEPT. REVISION	AS-BUILT REVISION	SERTAL NUMBER
4	50795	PRIME FOCAL PLANE ASSY	J	11	11	201
••	20793	TRING TOOMS TEMES ASSI	W126	3934A	3934A	
				3963A	3968A	
				3982A	3982A	
-	4			W126	W126	
2	51200	RADIATIVE COOLER ASSY	To.	E	E	003
3	51200	KYDIKIIVE COOLEK W221	E 3922A	3922A	3922A	00.3
			4201A	4201A	4201A	
			4216A	4216A	4216A	
			4269A	4269A	4269A	
			SB-W032	SB-W032	SB-W032	
	e .		W144	W144	W144	
			W147	W147	W147	
			W149	W149	W149	ė
			W151	W151	W151	•
4	50973	COLD FOCAL PLANE ASSY	В	В	В	201
	307.3		2870A	2870A	2870A	
•			3895A	3895A	3895A	
			4173A	4173A	4173A	
			SB-D004	SB-D004	SB-D004	
			W102R1	W102R1	W102K1	
	•		W109	W109	W109	
	•		W111	W111	W111	
•		다 있	W134	W134	W134	
r		PC	W135	W135	W135	
· 3	51337	OF POOR TELESCOPE ASSY	D	b	b	002
•			3866A	3866A	3866A	
	<i></i>	PAGE QUALI	3917A	3917A	3917A	* *
	e to the second second	A Ch	W129	W129	W129	
	•	TY S	W136	W136	W136	
			•			

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SECTION 2.11 RELAY OPTICS

2.11.1 Relay Optics

2.11.1.1

No performance data was taken at the subsystem level on this subsystem.

2.11.2 Acceptance Data

2.11.2.1 Configuration Lists

Pg 1 of 3

AS-BUILT CONFIGURATION LIST

RELAY OPTICS ASSY P/N 52534 S/N 003, FLIGHT

T N D	PART NO.	NOMENCLATURE	CURRENT REVISION	ACCEPT. REVISION	AS-BUILT REVISION	SERTAL NUMBER
1	52534	RELAY OPTICS ASSY	D + 1145A 4097A	D + 1145A 4097A	D + 1145A 4097A	003
2	50845	RELAY OPTICS BASE	C	C	C	003
2	50846	RELAY OPTICS HOUSING	D	D	D	003
2	51339	FOLDING MIRROR ASSY	A	A	. A	003
3	50857	MIRROR, FOLDING	В	В	В	005
2	51340	SPHERICAL MIRROR ASSY	A	A	A	003
· 3	50855	SPHERICAL MIRROR ASSY MIRROR, SPHERICAL RELAY OF COMMENT OF COM	В	В	В	005
2	51342	TRANSLATOR, INCHWORM QUALITY	B + 9721	B + 9721	B + 9721	5426 5428 5436
2	53412	→ THERMISTOR ASSY	B + 1126A 3801A	B + 1120A 3801A	B + 1120A 3801A	202
2	53414	TRANSFORMER ASSY	A	A	A	204 205 206
2	53744	ELECTRONIC ASSY, RIGHT BANK- IPS	A + 9552 9710 2924A	A + 9552 9710 2924A	A + 9552 9710 2924A	201
			3817A	3817A	3817A	
2	53753	ELECTRONIC ASSY, LEFT BANK- IPS	B + 3810A	A + 9551 1842A 2949A	A + 9551 1842A 2949A	201
				3810A	3810A	

P/N 52534

<u>L</u>	PART NO.	NOMENCLATURE	CURRENT REVISION	ACCEPT. REVISION	AS-BUILT REVISION	SERTAL NUMBER
	5 3 7 4 9	ELBX ASSY-OUTPUT ASSY-IPS	C + 3808A	C + 3808A	C + 3808A	201 202 203
	52024-1 52024-2	PWB ASSY-IPS OF POOR PWB ASSY-IPS	В	A + 7579 8385 8669 8964 9040 A + 7579	A + 7579 8385 8669 8964 9040 A + 7579	107 108 109 201 205 209
	52029	PWB ASSY-IPS	В	8385 8669 8964 9040	8385 8669 8964 9040	104 105
	53746	ELEX ASSY-OUTPUT PWB-IPS	A + 9597 9682 1706A	A + 9597 9682 1706A	1706A	
	53757	ELEX ASSY-REGULATOR MODULE	B + 3916A 4116A	A + 9277 9865 1289A 2086A 2102A 3916A 4116A	2086A 2102A 3916A	: : : :
•	53754	ELEX ASSY-100V RECULATOR	A + 9862 1705A D039R1	A + 9862 1705A D039R		

P/N 52534

ND VL	PART NO.	NOMENCLATURE	CURRENT REVISION	ACCEPT. REVISION	AS-BUILT REVISION	SERIAL NUMBER
4	52041	PWB ASSY, XFMR-MOUNTING	В	A + 8673 9256 9731 9828 1704A 1717A		
5	50875	СНОКЕ	В	A + 8443 1356A	A + 8443 1356A	F104

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RELAY OPTICS

P/N 52534

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Failure Reports Number

ratture K	ports number
Open	Closed
	F0553 F0555 F1669 F1744 F1747 F1748

Deviation	Waivers
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RELAY OPTICS

P/N 52534

	FLIC Failure No	e Report	Failu	OTOFLIGHT re Report No.	Failur	NEER e Report
	Open	Closed	Open	Closed	Open	Closed
		F0553 F0555 F1669 F1744 F1747		F0584 F1708 F1710 F1711 F1762 F1763 S8011 S8046		F0511 F0514 F0519 F0520 F0526 F1731
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SPACE AND COMMUNICATION GROUP FAILURE REPORT

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'	MARDINARS LIVEL D'ACCEPART DESTYSTESS ARCCURLY BOOULS CARD BOOKS ARLUNGS UNIT DESCRIPTION PART					
1	EQUIPMENT IDENTIFICATION NAME PART NUMBER SIX MANUACTOR	J82				
	1. CLEAVERCEN					
	54512 -003					
l	BACTOR DEMONSTRATE APPRICE ASSY 52534 003					
5	IV C NOOMER C NECES C CNUD					
ORIGERA	H.gnes					
8	12 TEST SPICES CASE CONTROL CO					
	TRESPONDENCENT CONTACTOR C					
	"SFRUE INCHUORM NO. 2 COMMAND ON TEST BOX USING FLIGHT IPS YIE	<u>'.p.s</u>				
1	MO MOTION IN DAMIN' (RETRACT) DIRECTIONS. R.O. MOUNTED ON DUMI	XK.				
	A.D. PLATE, WITH OTO SHIPS TO RELAX SPHERICAL MIRROR DIA PARAGRA	TOTAL PART				
-		DTAUSE SZU TSS				
	PARLICE AND FOUND MISSING WIRE IN TEST CARLE - 63					
UATRON	MISSING FROM CABLE CONNECTIALS BREAKOUT BUR TO WEARSAL	ER				
1		_				
À	10 PAILED ITTO MANSS AND PART RUSCUSS 20, USC POLUCIONS COMPACT RETUCT STOLLIGED	_				
BAGING EMING	22 GEST POLLOWING REMOTHER RECURSO SECALOS					
ğ	13 WIRE INSTALLED AS REQUIRED . UNIT WAS IN TERT CONFIGURA	-77 P.B				
"	ALO OVERSTRESS TO POWER SUPPLY WAS EXPERIENCED					
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	23. ACMODIST PROTEST ACTION TAKEN					
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9		- T				
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E NG	OF VERIFIED PAILURE SEVERIFIED TEST FROC. ASSY/PAG BERROR ROUGH MANGLING ORFSCT CODS DOPECTIVE PARTS TEST EST-UP WORKMANCHIP WEAR-OUT					
	38 PAILURE SO PRIMARY DURENCORN SEPARATION CRITICAL STREETS					
	17 WEST PARTY AND THE PARTY AN	12				
	12. ABLIABILITY JAG J 4/DATE 3-5-87 SUPPLIES AND JAG J 4/DATE 3-5-	10				
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HUGHES AIRCRAFT COMPANY
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FAILURE REPORT CONTINUATION SHEET

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_	identify entries by referencing fr block number in column, date each entry.	SHEETISI USEL
30		
صحا		UP A COPY
	OF THE SCHEMATIC DRAWING TO SHOW	LEADS
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	+50 LINES K3 AND L3 WERE REDUNDANAT 7	HELE FORE
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SPACE AND COMMUNICATION GROUP FAILURE REPORT

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٦	1	PARLUME ANALYSIS SUBSEQUENT OPERATION IN RETRACT (DOWN'S) PIRECTION NEARER						
	,	TO OPTICAL ALIGNMENT POSITION YIELDS LITTLE OR NO MAVEMENTS LYDT						
	: 1	CLAMP LOOSENING SHOWED PROBLEM TO BE INDEPENDANT OF LUDT ALIGNMENT						
. 1		EMAN KETI (DELINA (BI RESMUN TRACACIAL						
	3	A CHARLES HOT REQUIRED ASSOCIATED & WILL TO BE INSTALLED IN TERT						
CABLE UNIT WAS IN TEST CONFICURATION. NO DIES								
- 13		TO POWEL SUPPLY WAS EXPERIENCED.						
1		ZI.AUTHORIZATION BALLAND CRO CATE CONTINUATION CONTINUATI						
	T	2. REMODELLESTEST 4.3 WIRE INSTRUCTO AS PERUILED. 24.CA REMODEL						
1	.							
		Z QA RETEXT						
		zalist all paste roplaced Past humize Cit sym past lot no. cate code ser prograble depict amalyeis mo.						
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	Ì	27. REWOORK ORG GATE 22. RETESTED ORG GATE CONTINUATION OF						
r	1	ACTION ENCINEES REQUESTED A SPECIAL TEST CABLE BE						
		FARRICATED FOR THIS TEST HE MARKED UP A COPY OF SCHEMATIC						
	1	TO SHOW LEADS REDUIRED FOR THIS TEST. HE 13, FAB CLOSELAS						
-	1	THOUTHE K3 AND L3 WELL REDUNDANT BOTH						
		ARE +5 V LINES, THEREFORE HE DID NOT REQUEST 1, V						
		-3 BE WILED IN THE ENCINEER INVOLVED IS AWARE // 1000 100						
	Ŧ 1	OF THE DISCREPANCY AND WILL BE MOSE CAUTIOUS IN CONTINUATION						
- 1		22_DOCUMENT INFLEMENTING COMPRETING COMPRETI						
		CA GASIC CAUSE OSSIGN ON TEST EQUIP. MPG. PROCEDURE WIRING ERROR OSFECT CODE JE VERIFIED ERVIRONMENTAL TEST PROC. AESYIFAG ERROR ROUGH HANDLING DEFECT CODE						
١١		FAILURE PROGRAMMENTAL TEST PROC. APPLYING STROP PROUDS HANDLING DESCRIPTIONS						
)	a constant	DEFECTIVE PARTS TEST SST-UP WORKMANDHUP WEAR-OUT						
	a constant							
)		DEFECTIVE PARTS TEST SST-UP WORKMANDAID WEAR-OUT 25. FAILURE PRIMARY UNKNOWN JABATUM CRITICAL MINOR						

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SPACE AND COMMUNICATION GROUP FAILURE REPORT

	1. MODEL FLT " DESERVED O 900 1. OCCEPTADO CONTRADO CONTRADO CONTRADO	GA YB									
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	I PANCEN PAILURE TO THE TOTAL THE TO	INT .									
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	7. SUCTYSTEM										
1	a unit i										
	E BASSHELY DELAY DOTTES 52534 3 S	BRC_									
8	8 10. MODULE MICAM CARD										
1	\$ 11.OTHER										
ð	12 TEST WIGH OSVELOPMENT OUALIPICATION INTEGRATION CAUNCH CHEATLY OCCUPANCE										
	12. ENVIRONMENT MADIATION SEMBORATURE COMMENT THERMAL VAC HERS AT WHIN FALLURE GENERAL DE LENCURE VICENATION AKIS FOR MIN TYPE GITME	·									
	" DESCRIPTION LEST BANK LYDT DOES NOT REVERSE										
	RIGHT BANK DOES NOT RESPOND										
	INTEST COURSE STREET IN CORIGINATOR L. CRISS ORG DATE SE	12 CONTINUATE									
-	TREATMENT OF AND THE STATE OF T	SHEET USE									
}	PAILLING ANALYSIS FUSCIFICAL TRAVER SHOOT SHOW OPEN WER IN PROFE	GRE									
ğ	E CAPE AND WIRE WAR MISSING IN WEARSANGE PARE. UNIT WAR IN	1895									
13	CONFIGURATION. NO OVERSTERS OF PARTS ACCURED										
3	19. PAILED ITEU MANS AND PART MUNICIPAL										
3	TO STATE FOLLOWING ASSOCIAL PROGRESS REQUIRED REPORTED REMORRANGE AND WEARSAUSE.	ZETERT									
INTE	RELAY DITIES INCHWORM & LVDT										
3											
	21. AUDITORIZATION Balanchi 000 122-35 182-3-8	22. CONTINUAT SHEET MEET									
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5	MAT MUMICIA CXT SYM PART LOT MO. DATE CODE YER PROCEDES DEFECT	ANALYSIS NO.									
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	27. REWORK ORG DATE LARGTESTED CRG DATE SY	CONTINUAT SHEET USED									
Γ	DECAUSE AND CORRECTIVE PORCE WALLEMANISHIP CAUSED OPENS. ONE DISCLESSIVEY	LUAR AN									
1	DEN AT HZ IN CONNECTOR PZ THE OTHER WAS A HUSSIA	of we									
	IN WEAR SAVER	,									
	ASSEMBLY TECHNICIANS AND DIALITY	<i>\(\mathcal{L}\)</i>									
2		<i>\\</i>									
	CONTROL PERSONNEL WERE ADVISED OF THE	~~ \ 8 1									
1	DISCLETANCIES AND CAUTIONED TO PREVENT THERETON IN SOMETIMENT ON THE SHEET USED	1. 10%									
3	3 RICULATURE SHET USED	110									
1	CORRECTIVE ACTION	1									
ENGINE EMINGINE LIABILITY	2 JA. BABIC CAUSE OESIGN CEST COUIP WP2. PROCEDURE WIRING ERROR OUT 2 PAILURE ENVIRONMENTAL TEST PROC. ESTY FAB ERROR ROUGH MANDLING DEFECT 3 DEPECTIVE PARTS TEST SET-UP WORKMANSHIP WEAR-OUT	T CODE									
	35. FAILURE GRIMARY GUNCHOWN CLASSIFICATION GRITICAL SWINGR CLASSIFICATION GRIDOR SAFETY										
1	1) RESPONSIBLE W. Balingti JAG 2-3 5 JAG 2-3- 4 DE SACECRAST LA CAROLLE JAG 22-4	PARA 101									
1		20171									
	19. RELIABILITY BALL 200 - 200 SUPPLIES BY	DATE									

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EN SEGUE OF SECUENCE CALIFORNIA

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	el Begundo, California	1 7 0 0 0 0 0 0 0 0								
	1. PROGRAM NAME AND NUMBER	12 GLA 1/	1 MODEL 4 TIME	E OBSERVED S DA	TE ODSERVED 9 DA Z 9 YR 80					
	6. HARDWARE LEVEL SPACECRAFT WAS OBSERVED SYSTEM	SUBSYSTEM D	ASSEMBLY MOE	ule O	CARD PART					
	EQUIPMENT IDENTIFICATION:	NAME	PART NUMBER	S/N	MANUFACTURER					
	7. SUDSYSTEM									
	0. UNIT		- 							
	9. ASSEMBLY COMASSEMBLY	- W/08	53757		400					
108	10. C MODULE C MECAM C CARD	_10 PJ	33737	201 5	BRC					
Ş	11. OTHER	XMPR	52041							
DRIGINATOR	12 TEST WHEN DEVELOPMENT FAILURE WAS DESERVED IN-PROCESS	OUAURCATION	INTEGRATION	CH OPERATIONS	······································					
	13. ENVIRONMENT	☐ RADIATION ☐	TEMP THER	MAL VACHRS						
	WAS OBSERVED D EMC/RP	7 .	S FORMIN TYPE		THER					
	OF FAILURE TRANSPORM	2 (TI) HEADING	OPON AT SE	CONDARY C	IRCUT.					
					· <u></u>					
	15. TEST PROCEDURE		POYAMIDING	ORG DATE	17. CONTINUATIO					
-	16. VERIFICATION AND	14.1	Korax	22-35 10	-3-40 SHEET USED					
EVALUATION	FAILURE ANALYSIS TRA	FORTH WAS	SOME TO BE	DOFET/K	F PRIOR					
¥	TO APPLICATE	on OF POWOR								
뒴			19. FAILED ITEM NAME							
			PART NUMBER	52041 (T	1)					
2	2 D FOLLOWING REMORK/RETEST REQUIRED D REMORK/RETEST NOT REQUIRED BECAUSE CFRACE T1 (52041 5/W 202)									
2 D BFOLLOWING REMORNIAGE TACQUIARD SCAUSE REPLACE TI (52041 STW 202) B REMORNIAGE TO STREET NOT REQUIRED BECAUSE REPLACE TI (52041 STW 202) B RETEST POC. 16796 BOTE: Tacqueropelle of PRINTER WIRING BOORD BY PLN 52										
3	LIAN REMOVED & REPLACED ON PRINTED WIRMS BURRO EST PLA 52041.									
21. ALTROPRIZATION ORG CATE TO -27-80										
22. REWORK RETEST										
1831	TRANSFORMER REPLACED & FROM RETEXTED . SEE ATTACHED									
AMD	Dillin .									
3	28. LIST ALL PARTS REPLACED	4.02.02		2000404 0 00000	41441 20010 40010					
CTUSING	PART NUMBER CXT SYM	PART LOT NUMBER DATE COOS	MARUFACTURER	PROBABLE DEFECT	SMUN SIEYJANA					
	35745									
3										
MANUFA	27. REWORK BY	ORG DATE 22	AETESTED BY	ORG DATE	Ø CONTINUATIO					
	30. CAUSE AND			_ii	SHEET USED					
-	CORRECTIVE ACTION									
ļ	UNKNOWN. PAR	<u> </u>	ABILITY . CANTE	OL OF R	E MOVED					
	PAETS HAS BEEN CHA	NGED · PARTS AA	E NOW SENT	79	a ceosone					
SI.	MRB ON A NOME	CONFRAMING METER	AL REPORT AL	42	·					
9	DISPOSITIONED AR	NECESSARY PAR	S REQUIENCS	FAILURE	, , , , , , , , , , , , , , , , , , ,					
	ANALYSIS WILL BE	SENT TO THE	PARES BOARD	ONA	My Surver					
5	778 FORM (PETET) AN	D A SHIPPER TO	DANTES TO SE	NTINUATION	100-1182					
2	12. DOCUMENT IMPLEMENTING	and the second second	<u> </u>		7/7/0					
ENGINEERING/RELIABILITY	M. BASIC CAUSE DESIGN OF VERIFIED DESIGN	TEST PROCEDURE	ASSY/FÄB ERROR 🔲 ROUG	H HANDUNG	NENOWN OFFECT CODE					
2	25. FAILURE C PRIMARY	TEST SET-UP	IN FAILURE 10 CR	ITICAL (Z MINOR					
_ [TYPE I I NOUCED 37. RESPONSIBLE ENGINERA	ORG DATE	SLASSIFICATION TO MA	UOA	SAFETY DATE					
	XXXII Da	1225- 1-31-32	A Ruly D	Engel	5BRC 242/82					
- 1	SO SELIZABILITY	_ SI-41 DATE 2-82	4 OS OSHEN OR SUPPLIER	/	DATE					

202/02

SECTION 2.12
ELECTRONICS MODULE

2.12.1

Section 2.12.2

Electronics Module

Performance Data

The acceptance performance (test) data for the Electronic Module is contained in Appendix E of this report (Vol. IV, part E).

2.12.2 Acceptance Data

2.12.2.1 Configuration Lists

AS-BUILT CONFIGURATION LIST

ELECTRONICS MODULE ASSY REV 2 52247 S/N 201

THD	PART NO.	NOMENCLATURE	CURRENT REVISION	ACCEPT. REVISION	AS-BUILT REVISION	SERIAL NUMBER
2	52347	ELECTRONICS MODULE	D 4588A	В	В	201
				4293A 4242A 4091A 4113A	4293A 4242A 4091A 4113A	
3	3533003-100	MULTIPLEXER ASSY	С	.c	c	003
			R43009 43074 65661 65662 W124 W125	43074 65661 65662 W124 W125	43009 43074 65661 65662 W124 W125	
3 -	50869	POWER, SUPPLY ASSY	D	D	D	004
			2015A 2039A D030 D068 W074 W092 W093	2015A 2039A D030 D068 W074 W092 W093 W101	2015A 2039A D030 D068 W074 W092 W093 W101	ORIGINAL PAGE
3	50900	PWB ASSY, SERIAL MAGNITUDE COMMAND	c	C	C	는 100 200 200 200 200 200 200 200 200 200
			3716A D046 W06CR1 W097	3716A D046 W060R1 W097	3716A D046 W060R1 W097	

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		,			
50904-1	PWB ASSY, POSTAMP BAND #1	G	G	G	101
	1112 11001, 10011111 211110 112	4072A	4072A	4072A	
OTE: Configuration	n will conform to "As Built"	D045	D045	D045	
	rporation of EO 3142A	D090	D090	D090	
pending inco	ipotation of Eo 3142A	D105	D105	D105	
		W017	W017	wc17	
		W060R1	W060R1	W060R1	
		W097	W097	W097	
		W167	W167	W167	
50904-2	PWB ASSY, POSTAMP BAND #2	C	G	G	20
		4072A	4072A	4072A	
	n will conform to "As Built"	D045	D045	D045	
pending inco	rporation of EO 3142A	D090	D090	D090	· · · · ·
		D105	D105	D105	•
		W017	W017	W017	
		W060R1	W060R1	W060R1	
•		W097	W097	W097	
50904-3	PWB ASSY, POSTAMP BAND #3	C	G	G	20
		4072A	4072A	4072A	
OTE: Configuration	n will conform to "As Built"	DO45	DO45	D045	
pending inco	rporation of EO 3142A	D090	D090	D090	
		D105	D105	D105	
		D135	D135	D135	
		W017	W017	W017	
		W060R1	W060R1	W060R1	
		W097	W097	W097	
50904-4	PWB ASSY, POSTAMP BAND #4	C	G	C	20
		4072A	4072A	4072A	
	n will conform to "As Built"	D045	D045	D045	
pending incom	rporation of EO 3142A	D090	D090	D090	
		D105	D105	D105	일 으
		W017	W017	W017	<u> </u>
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ID IL	PART HO.		NOMEN	CLATURE				CURRENT REVISION	ACCEPT. REVISION	AS-BUILT REVISION	SERIAL NUMBER
	50908-1		PWB ASSY	, POSTAMP	BAND	# 5		D	D	ת	201
								3567A D090	3567A D090	3567A D090	
•		. •			•			W018 W060R1 W097	W018 W060R1 W097	WO18 WO6OR1 WO97	
								WU7/	HU37	WU 7 7	
	50908-2	** ;	PWB ASSY	, POSTAMP	BAND	#7	•	D	D	D	201
					٠			3567A D090	3567A D090	3567A D090	
	, ,	. · .						W018 W060R1 W097	W018 W060R1 W097	W018 W060R1 W097	•
l ,	50912		PWB ASSY	, POSTAMP	BAND	#6		E	E	E - 4	201
	· · · · · · · · · · · · · · · · · · ·	•						D091 D094	D091 D094	D091	
								D136 W060R1 W097	D136 W060R1 W097	D136 W060R1 W097	٠,
.	50916		PWB ASSY	CALIB. S	HUTTE	R MAI	N	F	F	F	201
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					:	<i>; .</i> :		D104R1 D109R1 D111	D104R1 D109R1 D111	D104R1 D109R1 D111	:
	•		•			.•		D116 D117	D116 D117	D111 D116 D117	•
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3 50926 PWB ASSY, CALIB LAMP AND INCHWORM DRIVERS D044 D044 D044 D088R1 D088R1 D015 D115 D115 D115 D115 D115 D115 D11									
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51398	CALIB. SHUTTER BACKUP	:	E	E	E	101
31373			4031A	4031A	4031A	
		1	4452A	4452A	4452A	
			D056	D056	D056	
			D108R1	D108R1	D108R1	
			D116	D116	D116.	
			D133	D133	D133	
			D137	D137	D137	
			D147	D147	D147	
			D153	D153	D153	•
			SB-W033	SB-W033	SB-W033	
			W060R1	W060R1	W060R1	
		٠.	W097	W097	W097	
51402	PWB ASSY, TELEMETRY SCALING	•	D	D	D	201
31402	FUSELINK		3685A	3685A	3685A	
	TOOLITAK		3691A	3691A	3691A	
			3710A	3710A	3710A	ORIGINAL OF POOR
			4288A	4288A	4288A	7 2
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61705	PWB ASSY MACRO DISCRETE		F	F	F	102 6
51795	FWB A551 MACKO DISCRETE	*	3720A	3720A	3720A	202
			3835A	3835A	3835A	·
			D065	D065	D065	•
			D113R1	D113R1	D113R1	, .
			D113&1	D130	D130	
		,	W060R1	W060R1	W060R1	
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ı	51813		MACRO DISCRETE		С	С	С	201
,		,			3705A	3705A	3705A	٠
				. :	D078 W060R1	D078 W060R1	D078 W060R1	
					W097	W000K1	W097	
t .	52250-1		PWB ASSY, SCAN LINE		С	С	С	
•	32230-i		CORRECTOR		·	•		
					1080A	1080A	1080A	
					1638A	1638A	1638A	
	•	•	•	s +	2671A	2671A	2671A	
		e e e e e e e e e e e e e e e e e e e			3272A	3272A	3272A	
		**			3712A W011	3712A W011	3712A ₩011	. 00
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		•			W097	W097	W097	ORIGINAL OF POOR
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ı	52250-2		PWB ASSY, SCAN LINE					PAGE IS QUALITY
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			•		1080A	1080A	1080A	∃ ,,
					1638A	1638A	1638A	
		*			2671A	2671A	2671A	
					3272A	3272A	3272A	
	4	•			3712A	3712A	3712A	
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· •	52348		CABLE RTG ASSY		F	F	F	005
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TND LVL	PART NO.	NOMENCLATURE		CURRENT REVISION	ACCEPT. REVISION	AS-BUILT REVISION	SERTAL NUMBER
3	52360	COVER, TOP	•	В	В	. В	
		:		1620A	1620A	1620A	
	•			1854A	1854A	1854A	
				1877A	1877A	1877A	
3	52362	COVER, BOTTOM	•	В .	В	В	•
				1855A	1855A	1855A	
				1884A	1884A	1884A	
3	52363	COVER, BOTTOM FRONT		В	В	В	
		•	•	1621A	1621A	1621A	•
				1856A	1856A	1856A	
				1878A	1878A	1878A	
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3	52797	PWB ASSY AUX CIRCUI	T BOARD	. C	.C	C ·	201
				3711A	3711A	3711A	
			•	W014	W0.14	W014	
				W060R1	W060R1	W060R1	
	•	•		W097	WO 9 7	W097	
							•
. 3	53393	COVER FRONT		· A	Α.	A	
			•	1879A	1879A	1879A	
3	53877	PWB ASSY, MOTOR DRI COOLER DOOR	VER	B :	В	В	101
		•		3706A	3706A	3706A	
				D037	D037	D037	
				D098	D098	D098	0.0
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3	16268	PROCESS SPEC, SURFACE MTD COMPONENTS	A	A	A	
		,	2216A	2216A	2216A	
			2940A	2940A	2940A	
			3080A 3283A	3080A 3283A	3080A 3283A	
3	16704	ACCEPTANCE TEST, PROCEDURE FOR ELECTRONICS MODULES	С	С	С	
			3987A	3987A	3987A	
			4059A	4059A	4059A	
			4089A	4089A	4089A	
			4159A	4159A	4159A	
•			4180A	4180A	4180A	

R. A. Groves, CDMO

W. D. Adams Quality

ORIGINAL PAGE IS OF POOR QUALITY

Listing of Liens

ELECTRONIC MODULE

P/N 52347

FLIGHT

ORIGINAL PAGE IS OF POOR QUALITY

Open	Closed	Closed
S8021	F0606	S8315
	F0622	S8316
	F1666	S8320
**	F1667	S8321
	F1668	S8325
	F1761	S8326
	F1769	S8327
	F1774	S8329
	F1776	S8343
	F1781	S8363
	F1783	S8364
	F2722	S8365
	F2723	S8367
100	F2724	S8368
	S8049	S8372
	S8050	S8384
	S8051	S8390
	S8107	S8407
**	S8108	S8446
	\$8109	S8447
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Deviation	S	Waivers
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ELECTRONIC MODULE

P/N 52347

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	F1783	S8407	· ·	F1715 F5189		F0564
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	F2723	S8447		F1773 S8024		F1720
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Program Instruction 010

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SEE VIL-STE-10 OF 11 FOR INSTRUCTIONS) 11/05	/81	•	
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Santa Barbara Research Center		X SEVIATION	4417(4
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		04	-:30
54310 terminals are unavailable in	n SBRC or HAC	stores. Cut	side
procurement estimated at 3 months.	. Thematic D	Mapper schedul	e slip
of 3 months will result if alterna	ate terminal	usage is not	approved.
Note: P/N 53413 is not on the TM Approv	ed Parts and Mo	ecertais List, m	///
they are on the MSS Approved Parts and M	aterials List.		1/5/
		3	Chi- 100
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Program Instruction 010

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SANTA BARBARA RESEARCH CI	ENTER			X OEVIA	1001		COLASA
75 COROMAR DR. GOLETA, (CA. 93117			X minos		ma.06	CRITICAL
4. DESIGNATION FOR DEVIATION/W		3. BASE LINE AF	FECTED		6. OTH	ER SYSTEMS	/ COSSF QJ -
MODEL/TYPE 4. WR. CODE 4. SYS. DESIG.	4. 227/441468 00.	TIONAL [JALLO-	>≥000·			ີ່ ແລ
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. DESCRIPTION OF DEVIATION VALVER							<u></u>
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Program Instruction 010

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MATERIAL REVIEW FOR THE CONTROL ORDER

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OPR QTY QTY INSP ACC SUS OPER INSTRUCTIONS - COMMENTS DATE NO. P1. 4) Which PARTERUING 27-15 1 2 & 2 Rassar= Work Short Atherther TO WIRCO INSPECT PUT 100 5-10/200 Per SP 80165 Filly slat AP 300 MCI Relumbo MRB 400 RETURN THIS CARD TO MATERIAL REVIEW FOR RECORD CLEARANCE. LAST CPR

ORIGINAL PAGE IS OF POOR QUALITY 1 IURIO Y231 20804 BEAL

ORIGINAL PAGE IS OF POOR QUALITY Program Instruction 010 SATE PREPARED PROCURING ACTIVITY NO. RECUEST FOR DEVIATION/WAIVER ISEE MIL-STD-480 OR 481 FOR INSTRUCTIONS) 13 January, 1982 SANTA BARBARA RESEARCH CENTER X DEVIATION DAIVER 75 Coromar Drive, Goleta, CA 93117 X MINOR 144.09 CRITICAL 4. DESIGNATION FOR DEVIATION/WAIVER S. BASE LINE AFFECTED 4. MODEL/TYPE b. MFR. CODE YES TM 11323 D136 Fl SPECIFICATIONS AFFECTED-TEST PLAN 8. DRAWINGS AFFECTED MFR. CODE. SPEC./DOC. NO. NJ (MALDI REV. ISPR. CODE KOR. NO. e. SYSTEM 11323 4. 17EM 50912 C. TEST PLAN TITLE OF DEVIATION/VALVER O. CONTRACT NO. & LINE ITE Band-6, Voltage Regulator, Series Resistor Change NAS5-24200 IT. CONFIGURATION ITEM MOMENCLATURE 7 3818E 12. CO NO. MI KOR Radiometer II MAJOR IS. MANE OF PART OR LOWEST ASSESSED AFFECTED 17. LOT NO. IS. RECURRING DEVIATION WAIVER PWB ASSY Postamp-6 YES 50912-E Fl. 1 21. EFFECT ON DELIVERY SCHEDULE 20. EFFECT ON COST/PRICE EZ. EFFECY ON INVEGRATED LOGISTIC SUPPORT, INVERFACE, ETC. 23. DESCRIPTION OF DEVIATION VALVER Alternate wiring, replaced components, and added components per E03456A required using SP80165. This Engineering Order provides the voltage regulator with current capability to prevent power foldback at Band 6 turn on. Possible component stress as well as initial circuit performance degradation is corrected by the modification. 24. NEED FOR DEVIATION/ WAIVER The Band-6 voltage regulator goes into current limit due to turn-on characteristic of circuit. This characteristic is unacceptable. Redesign and reprocurement of electronic circuit boards would be required to eliminate cuts and alternate wiring. Minimum 5 months schedule slip and considerable cost would be involved. 1-13-82 SYS ENGR

51065 SN 003 only

26. SUBSTITUTE ACTIVITY AUTHORIZING SICHAPURE

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Z READ NAS GZOCI		No. 10 (NAS620) 20-
AR J-W-1177		UG ZG , J. W. 1177, TYPE 14 ; 82
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3. IN GENERAL NO	TES, ADDED:	
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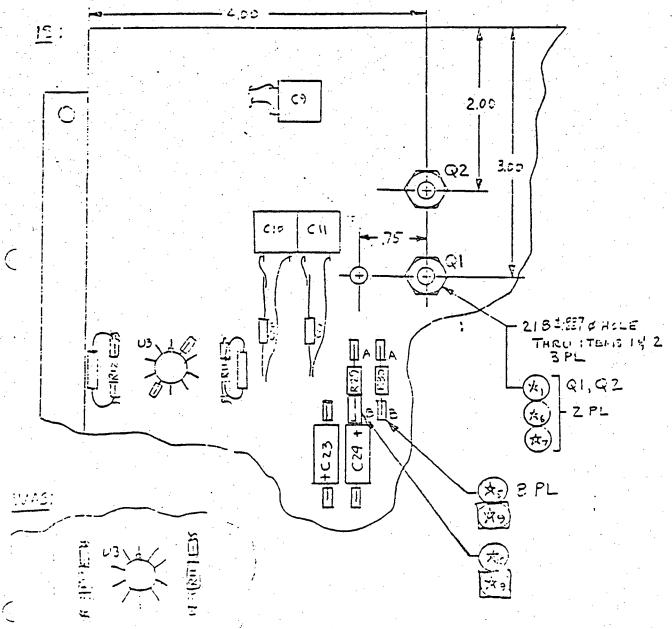
SENC ENGINEERING ORDER REVISION NOTICE NO. 3450 A

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DRAWING NUMBER 50912 (4)

THATEL FIER G & COMMAND RELAYS (A16)

5. CN F/D, SH3, ZONE 3D ADDED GI-Z, RZA-BU, C 23-24 & PAD PATTERNS; RELOCATED RII-12.



ESTO I ENGINEERING ORDER REVISION NOTICE NO. 347. A SHEET 1 OF 3 THE HITTER WITTER WITTER AS 2 Y A								
JAMPUTTER G ECOMMINAND RELAYS (A16) 50712 (2) FORTHUMER PLING THE PROPOSITION RELAYS (A16) 50712 (2) FORTHUMER PLING THE PROPOSITION RELAYS (A16) 50712 (2) FROM THE PROPOSITION OF T	COL INC.	EN	GINEER	ING OI	RDER /-	REVISION	W-NOTICE	NO. <u>F457-7</u>
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FELLING CHANNER PLITED REDUCES ITEMS COMPONING CLASS CHANGE DEAMING TIPE REDUCES RESISTED RESISTED CANCELS AND SUFER SEDES CO. 329111 241444 1. IN LIM. CHANGED PN, ITEM 18 IS: FORGIT-2CG RESISTED 21,5%, 2W WAS: FORGES-23 RESISTED 22,5%, 1/6 W 2. IN LIM, ABORD ITEMS & THRU RE 3. IN GROEF -126 RESISTED RESI							50912	(2)
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THE COLL COME SECULATION CHANGE DE PIN, ITEM 18 15: FOEGII-209 RESISTOR, 13 1%, 2W WAS: 90865-22 RESISTOR, 21, 5%, 1/6W 2. IN LM, ADDED ITEMS 'AT THRU WE 2. REGISTOR, 22, 5%, 1/6W 2. REGISTOR, 21, 5%, 1/6W 2. REGISTOR, 21, 5%, 1/6W 3. O8678-126 RESISTOR, 2.49, 1%, 1W 3. O8655-186 22577 CAPACITOR, 10NF, 10%, 50V 8 SC80181-8-2 PAD PATTEIAN 2. NASI291C3 NUT, SELE-LEG, 190-32 (NASI291) TO 2. REGID NAS G20010 WASHER FLAT, NO. 10 (NASI291) TO 3. IN GENERAL NOTES, ADDED: 3. IN COMPONENT IDENT TABLE, ADDED 4. ITEM X, 4								MOER
1. IN LW. CHANGED PW, ITEM 18 15: FOEGII-204 RESISTOR, 13 1%, 2W WAS: FOEGES-22 RESISTOR, 21, 5%, 1/8W 2. IN LM, ADDED ITEMS 'AN THRU TE 2. REQU FOEES: 1 22577 TRANSIST ; FWR, NPN (2N2752) XI 4.06676-135 RESISTOR, 2.49, 1%, 1W 2. 908678-124 RESISTOR, 2.49, 1%, 1W 3. 908555-186 22577 CAPACITUR, 10, 107, 50V 2. NASI291C3 NUT, SELT-LEG, 190-32 (NASI291) 2. REQU NAS GEOCIC WASHER FLAT, NO. 10 (NAS GEO) AR J-W-1177/14 WIRE, INC. JL, AND C. 26, J. W-1177, 17/15/15/15/2 3. IN GENERAL NOTES, ADDED: 3. IN GENERAL COMPONENTS, PAD PATTERNS AND WIRE PER SPECIOS, PROCEDURE C. 4. IN COMPONENT IDENT TABLE, ADDED Q1, Z ITEM XI R20 ITEM XI R20 ITEM XI R20 ITEM XI R21 ITEM XI R22 ITEM XI R23 ITEM XI R34 ITEM XI R35 ITEM XI R36 ITEM XI R37 ITEM XI R37 ITEM XI R38 ITEM XI R39 ITEM XI R30 ITEM XI R30 ITEM XI R30 ITEM XI R30 ITEM XI R31 ITEM XI R32 ITEM XI R33 ITEM XI R34 ITEM XI R35 ITEM XI R36 ITEM XI R37 ITEM XI R37 ITEM XI R38 ITEM XI R39 ITEM XI R30 ITEM XI R30 ITEM XI R30 ITEM XI R31 ITEM XI R32 ITEM XI R33 ITEM XI R34 ITEM XI R35 ITEM XI R36 ITEM XI R37 ITEM XI R37 ITEM XI R38 ITEM XI R38 ITEM XI R39 ITEM XI R30 ITEM XI R31 ITEM XI R32 ITEM XI R33 ITEM XI R34 ITEM XI R35 ITEM XI R36 ITEM XI R37 ITEM XI R37 ITEM XI R38 ITEM XI R38 ITEM XI R30 ITE	•							
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2. IN LM, ADDED ITEMS & THRU & 225T7 TRANSIET , FUR, NPN (2N2752) %, TC86 76-135 RESISTED, 2.49, 1%, 1W & 208678-126 RESISTED, 2.49, 1%, 1W & 208678-126 RESISTED, 2.00, 1%, 1W & 208678-126 RESISTED, 2.00, 1%, 1W & 208555-186 22577 CAPACITUD, 10, 10, 10%, 50V & 208555-186 22577 CAPACITUD, 10, 10, 10%, 50V & 208510-8-2 PAD PATTERN AND WAS 2000 RELEVANCE OF AN ASSISTED AND WASHER FLAT, NO. 10 (NASC20) WASHER FLAT, NO. 10					-	-		
2 REGD SCEEC 1 22577 TRAILINGT , FUR, NPN (2N2752) 31, 106676-135 RESISTED, 2.49, 1%, 1W 22 908678-126 RESISTED, 2.00, 1%, 1W 22 908555-186 82577 CAPACITED, 10, pf, 10%, 50V 22 SCR 0181-8-2 PAD PATTERN 2 NAS1291C 3 NUT, SELE-LEG, 190-32 (NAS1291) 32 2 REGD NAS G20C10 WASHER FLAT, No. 10 (NAS 620) 22 AR J-W-1177/14 WIRE, INJUL, ALUG 26, J-W-1177/14/15/16/20 3.1N GENERAL NOTES, ADDED: 29 INSTALL COMPONENTS, PAD PATTERNS AND WIRE PER SP20165, PROCEDURE C. 4. 1N COMPONENT IDENT TABLE, ADDED C17, Z ITEM 22 R20 ITEM 22 **HOTE AND/OR ITEM NUMBER TO BE ASSIGNED AT TIME OF INCORPORATION CONTINUES TO BE ASSIGNED AT TIME OF INCORPORATION CONT		V/15. 909	१६८५-१	.3 RESI	STOR, 2	22,5%	,1/sW "	
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908555-186 82577 CAPACITOL, TONF, 10%, 50V SCRC181-8-2 PAD PATTELLN 2 NAS1251C3 NUT, SELE-LEG, 190-32 (NAS1291) TOL 2 REED NAS GOOLIO WAS HER FLAT, NO. 10 (NAS GOOL) AR J-W-1177/14 WIRE, INJUL, ALUG ZG, J-W-1177, TYTEM TOL 3. IN GENERAL NOTES, ADDED: PER SPOOLOS, PROCEDURE C. 4. IN COMPONENT I DENT TABLE, ADDED Q1, Z ITEM X1 R20 ITEM X1 R20 ITEM X2 TOLL TX4 THOSE AND/OR ITEM NUMBER TO BE ASSIGNED AT TIME OF ACORPORATION THOSE TOLL TO BE ASSIGNED AT TIME OF ACORPORATION AND DATE MANUFACTURING APPROVAL DATE INCORPORATION ICCRED BY DATE MANUFACTURING APPROVAL DATE INCORPORATION TAKES APPRECIAL DATE MANUFACTURING APPROVAL DATE INCORPORATION THAT IS A APPRECIAL DATE MANUFACTURING APPROVAL DATE INCORPORATION THAT IS A APPRECIAL DATE MANUFACTURING APPROVAL DATE INCORPORATION THAT IS A APPRECIAL DATE MANUFACTURING APPROVAL DATE INCORPORATION THAT IS A APPRECIAL DATE MANUFACTURING APPROVAL DATE		، <i>څ</i> ن ب	678-135					
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SCROLSI-8-2 PAD PATIEURN NASIZITE 3 NUT, SELE-LEG, 190-32 (NASIZSI) TO LEGED NAS GZOCIO WASHER FLAT, NO. 10 (NASGZO) WASHER FLAT, N	152	306	555-186	82577	CAPACIT	10 NF	10%,50V	
2 REED NAS G20C10 WASHER FLIAT, NO. 10 (NAS G20) AR J-W-1177/14 WIRE, INCLIDENCE ZG, J-W-1177, TYPEM; T. 3. IN GENERAL NOTES, ADDED: 29 INSTALL COMPONENTS, PAD PATTERNS AND WIRE PER SPECIOS, PROCEDURE C. 4. IN COMPONENT IDENT TABLE, ADDED Q1, Z ITEM \$1 RED TEM \$2 ITEM \$2	8	SC8	0181-8-2	<u>.</u>	PAD PA	TIERN		15
AR J-W-1177/14 WIRE, INC. JL, ALUG 26, J. W. 1177, TYTEM; 12. 3. IN GENERAL NOTES, ADDED: 29 INSTALL COMPONENTS, PAD PATTERNS AND WIRE PER SPROIGS, PROCEDURE C. 4. IN COMPONENT IDENT TABLE, ADDED Q1, Z ITEM \$\frac{1}{2}\$ REO ITEM \$\frac{1}{2}\$ REO ITEM \$\frac{1}{2}\$ ITEM \$\frac{1}{2}\$ RED ITEM \$\frac{1}{2}\$ WHOTE AND/OR ITEM NUMBER TO BE ASSIGNED AT TIME OF INCORPORATION ***********************************	2 .	NAS	1521-63		NUT, SE	L.= · L. < G ;	.190-32 (NAS	\$1291) - #
3. IN GENERAL NOTES, ADDED: Solution State Stat	2 RE	CAN DO	650010		WASHE	e slat,	NO. 10 (NA	S 620) - %
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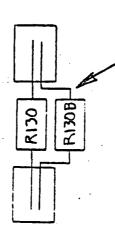
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Program Instruction 010

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Program Instruction 010

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SPACE AND COMMUNICATION GROUP FAILURE REPORT

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SPACE AND COMMUNICATION GROUP FAILURE REPORT

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9	^교 다	POLLCHING REWORK!	RETEST REQUIRED REQUIRED COCAUSE	RESOLUTION	OF FAILU	RE TO BE		IFD EX	CHANGING
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\vdash	ZI.ASMOR	Z/RETEST TAKEN	la per	ZERU	2CX 2	BECAUS	E OZIGIN	di CE	ECS 24.00
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1	-	1	LAS TO	3V F.L)		77-61			ZS. CA ACTEST
ACTURINGAND						 	***********************************		
3	28. LUST AL	L PARTS REPLACED	CCT SYM	PARTLOTHO.	DATE COOR 1	- AND	POGACLE DEFE	T 1	ANALYSIS NO.
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1									
	27. A EWOR	*		RG OATE	20.FETESTEC	D	DAG I	DATE	CONTINUATION SHEET UEED
-	84	AMO CORRECTIVE			20. RETESTED		388 1	DATE	CONTINUATIO
-	84				ZA PETESTER		عوم مد	DATE	CONTINUATIO SHEET USED
	84	AND CORRECTIVE	4,57		A CA		200	DATE 33,780 CL	
	10 CAUSS ACTION	AND CORRECTIVE			A CA		SAIN CAIN		
114	84	AND CORRECTIVE	4,57	7 CHANGE	szec. Max		200		
iABILITY	10 CAUSS ACTION	AND CORRECTIVE	4,57		szec. Max		200		
IMELIABILITY	10 CAUSS ACTION	AND CORRECTIVE	4,57	7 CHANGE	szec. Max		CAIN CAIN CAIN TACHED	33.749 CL	
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GINEERING/MELIABILITY	12 DOCUM 122 DOCUM 124 DOCUM 124 DOSUM 144 DOSUM 144 DOSUM 144 DOSUM 144 DOSUM 144 DOSUM 144 DOSUM 144 DOSUM 144 DOSUM 144 DOCUM 144 DOC	AND CORRECTIVE	487 0, 989 16. 1	7 CHANGES 26 dh 68T DATA	SPEC. MAX SHEE	MAX TEST	CAIN GAIN STREET USE	33, FRECL	OSLARE UNK NOWN
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ANGINE RING/MET (A BILL 17 ¢	32. DOCUM ACTION ACTION 14. AQ 14. AQ 15. GARGE 34. VER "ALLUM"	AND CORRECTIVE	JESTON SESTON SE	CHANGE 26 dh EST DATA BATAL PLANTS UNCLOSURE SAGO 20 20 20 20 20 10 10 10 10 10 10 10 10 10 10 10 10 10	SPEC. MAX SHEE	MAX TE 3T TS A MFG PROCEI ASSYLFABOR WORKMAN	CALL CALL CALL CALL CALL CONTINUE III. CONTINUE SHEET USE CALL CONTINUE CONT	33, PRO CL	OSLARE UNK NOWN OH PECT CODE

Hughes

SPACE AND COMMUNICATION GROUP FAILURE REPORT

	GHES AIMCHAP! COM				•		_
	PROGRAM NAME	VOII	2. GLA	1. 4000 FLT	* TIME OSSERVED A.M.	S. DATE	UEY ZI. 1481
	L HARDRANG LEVEL BALUAE WAS OEBSTO BA	PACECRAFT EVETER	D SUCCYSTEM	ASSEMBLY	- econt		CARO PART
1	EQUIPMENT ICENTIFICATION		YAMĞ		PAIT NUMBER	\$/#	MANFUACTUER
1	7. SUBSYSTEM					 	· .
-	E UNIT 1		3 47				
1	R MARRIAGEN DE	SAND	FOST AND	BD. SO	10 6-4	401	Sara
5	10. O MODULE	E CARO					
Ĭ	11.0THER		· · · · · · · · · · · · · · · · · · ·				
8	12 TEST MIEN FAILURE MAS OSSERVED	DOVELOPMENT IN-PROCRESS	QUALIFICATION ACCEPTANCE	H INTE	MATION SE	- Luw-010*	RATIONS
	13. ENVIRONMENT WHEN FAILURE WAS OSSERVED		TEMPER		THE THERMAL VAC		утыся
	14 DESCRIPTION CH	LANNELS 1	2.4.56.7.9	10.11.12.1	3 RE 15 E	16 FAIL	70
	MEET TRA	MSIENT AND	JOR FREQUE	TAIRY PPSA	DALSE REC	211000115	ITS ACONE
-		ESISTORS M		STANDOFF			I DE LES
			AVED FROM		004	RA	CONTINUATION
-		597 4	(A) THE CHILDREN	V. C. DAV	SOM 72	3-7-21-	SET DESTUSSED
	FAILURE AMALYEIS	······································	·			·	·
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15							<u> </u>
1				AND PART NUME	e A		
1	M. COT FOLLOwing ACING	REJACTEST REQUIRED TO	MARCHARILY	PLACE		POLLAR	
1			2				
theint to	RESISTOR		andrees	MEASURE	KENSTE	<u>veelva</u>	ues,
-	TRANSIEN	T & FREAR	ZEALCY RE	SPANSE (A	the same of the sa	D RIS	
L		a	D.M. K	AMAGEL /A!	121-2	23 17-22-	SI CONTINUATION
T	D. REWORK /RETEST	collection.	uran Some	seten In	Pin more	Geor Erm	AGNORE
1_	FRA and an	and made	land of the	alica estil	ed 1 =	O. A 730	
12	ZPA A.	Min and a second		2. 65 1.00	to see and live		IL CA AGTEST
ş	36 1031	7/0-03.40	olina. Te o				
1 3	PETUST ALL PRATS REPLACE		Service - Co	out Samples	addin.		
13	PART NUMBER	CKT SYN C	ART LOT NO. DATE C	656 usa	PROBABLE DEFE		ANALYSIS NO.
. §							
3							
1							
L	27. REWORK	076	DATE 20	EG TESTED	IONG	DATE	CONTINUATION SHEET USED
Γ	30 CAUSS AND CORRECTIVE	Moratine	was cons	laging or	The FRA	Alema	select
1	thatana de	e to made	anate No	cas II -	on the PPA	Nd.	llow
1.	had been	inchessed	in a single	- Deart	To TPA	33.FRE CEO	SURE
	Val			PE- 12-23			÷
1 =			7/	<u> </u>	-34		. ^
1			· · · · · · · · · · · · · · · · · · ·			11	. N
13					215 CONTINUE	7//	1/81/ 1/2/
چ چ	33.DOCUMENT IMPLEMENTIN				215 CONTINU	****/////	6 10 10 13
THEIMLE HING MESTABILITY	CORRECTIVE ACTION		the second name of the second na		**	1// //	
. 3	34 BASIC CAUSE 3F VERIFIED FAILURE	ENVIRONMENTAL	TEST EQUIP	MFG. PROCED		7 -	UNKNOWN !
1-		DEFECTIVE PARTS	en in in	WORKMANSH			Er Colle
	35. FAILURE T		L'+O tsini	JE FAILURE JLASSIFICATION	CRITICAL	55 (nimo	
1		confres // 155/40	FAILURE		1 Thuas	SZP ET	· , .
- (12 RESPONSIBLE A ILA A	// /// // // // // // // // // // // //	7 / C = DATE / -	A / 18 SPACECHARY	1 200	1 OPE	PATER LONG
	17 RESPONSIBLE	Nanclas SAGE	7/22 3 1 1/8/ 51. 1 1 3 17 - 18		Lange	1225	

HUGHES AIRCRAFT COMPANY

SPACE AND COMMUNICATION GROUP FAILURE REPORT

ľ	1 PROGRAM NAME TM - H S 236 2 GLA 1. MODEL F/+ "TIME OFFERNED 9:00A 5. PATE NED 9 24 78
1	
1	& MARGONARE LEVEL SPACECRAFT SUBSYSTEM SAGESMOLY SHOOLLE CARD MICH FALLER MAG OBSERVED MICAD PART
*	EQUIPMENT I DENTIFICATION: NAME PART NUMBER SIN MANUACTUER
	7. SUCEYSTEM
	& UNIT
١.	B. 图ASSEMBLY DEMONSTRATE PWB ASSY-Motor Driver Wolfer Door 53877 101
	R - FOR HOST TOTAL DELIVER CHARLES 2.30 / /
5	IG MODULE MICAM CARD
ğ	11.07M&A
3	12. TEST WHICH PAILURE WAS ACCEPTANCE DIAPROCRESS GUALIFICATION INTEGRATION CAUNCH OPERATIONS ACCEPTANCE SYSTEM
	13. ENVIRONMENT AMMERYT RAMATION TEMPERATURE "THERMAL VAC HARE AT
	14 DESCRIPTION
	Was: +5.628 V and Should Be: 0.00 ±0.3V.
1	ATEST 1 2 2 PAGE 1 LIB OBSCIMATOR TO 2 200 DATE 1 2 CONTINUATION
_	**************************************
	PARLURE AMALYES Open Circuit on Rin 4 of ARI, ARZ, and ARZ
	where an incomplete "cut and jump" hadborreworked per
1	EO 2762A, Added resistors were soldered to traces to cut instead
13	C 1 1 A 10 FAIL FOLLEGE MARCE
2	
1	The second person in the column Rework to Print 5.3877 and E0 2.762/
1	
3	
	ZI.AUTHORIZATION E. Aasted ORG DATE TO CONTINUATION SHORT USED
	Z. REMOVEMENT ZEWORKEL/TO EO 2762A
	Functional Test per 16 237 . Rev F
3	TA COMPANY
AMU TEST	23 ACTUSES
ING AND TEST	
TURING AND TEST	ZOLIST ALL PARTS ROPLACED PART MUNICIPA CRT SYM PART LOT NO. DATE CODE MAR PROGRABLE DEFECT AMALYTIS NO.
OF ACTURING AND IEST	TRUST ALL PARTS ROPLACED
MANUFACTURING AND 1187	ZOLIST ALL PARTS ROPLACED PART MUNICIPA CRT SYM PART LOT NO. DATE CODE MAR PROGRABLE DEFECT AMALYTIS NO.
MANUFACTURING AND TEST	ALLIST ALL PARTS ROPLACED PART MUNICIPA CRTSVM PART LOT NO. DATE CODE UPR PROGRAPLE DEFECT ANALYSIS NO.
MANUFACTURING AND TEST	PART MUNICIPAL CRT SYN PART LOT NO. DATE CODE MAR PROSABLE DEFECT ANALYSIS NO.
MANUFACTURING AND IEST	ALIST ALL PARTS ROPLACED PART MANCIAR CRT SYM PART LOT NO. DATE CODE MAR PROGRAPLE DEFECT AMALYTIS NO. HONG TO REMORK Horterian Samen 380 DATE 9/21/81 TRESTED E. Aqstod ORG 22-13 DATE 9-22-11 CONTINUATION SHEET USED
MANUFACTURING AND TEST	TO REMORK Horterian Same and 19/21/81 REPETSTED G. Agsted ORG 122-13 19-22-11 12 CONTINUATION DE CAUSE AND CORRECTIVE EO 2-1628 was not carrectly imptemented.
MANUFACTURING AND TEST	MONE TO REMORE Hoterian Sander 200 2019/21/81 REPRESTED E. Agated 200 22-13 2018 9-22-11 Constitutation in the constant of th
MANUFACTURING AND TEST	Reliet All Parts ROPLACED PART MUNICIPA ANALYSIS RO. ANA
MANUFACTURING AND TEST	MONE TO REMORE Hoterian Sander 200 2019/21/81 REPRESTED E. Agated 200 22-13 2018 9-22-11 Constitutation in the constant of th
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CHGINEEHINGIHELIABILITY MANUFACTURING AND TEST	PRINTER PRODUCTION TO STATE OF THE PRODUCT OF THE
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HUGHES

SPACE AND COMMUNICATION GROUP FAILURE REPORT

		,					
	1 PROGRAM NAME	4 . HS-236	2. GL	1. WOORL F1+	TIME OSSERVED 9:00 P	S. DATE OGSERVED	"il ia si
	E MARCHARE LEVEL WHEN FAILURE WAS OSSERVED	PACECRAFT	2uesvetew	OX) ASSEMB			CARO
1		SYSTEM	. Unit		PART NUMBER		MANFUACTUER
1	P. SUDSYSTEM		NAME		, an increase	 	WARFOACTOER
	& UNIT.					 	
	 	MESHELY PINT A	SSY, TOMB, CO		50920	101	SBRC
1.	10 MODULE HICK		SSY, Tomp, C.D	1 mtm	30/2.0	1	2000
0.4	11.OTHER		······································			 	·
5		DEVELOPMENT	CUALIF ICATH	· ·	INTEGRATION	LAURICH OFE	PATIONA
1	17. TEST WHEN PAILURE WAS OSSERVED	- In-Moones	OZ ACCEPTANCE		SYSTEM		
	13. ENVIRONMENT AMEN FAILURE WAS OSSERVED	MOSENT NO	PURT COTAL		TYPETHERMAL VAC		Г • Эгнея
	14 DESCRIPTION Me	an resista	uce of val	ues det	ermined in 4	3.2 0100	1 4.3.3
	is not-wi	thin specifi	cation li	witz . u.	is it co	apa ble	of being
	corrected	0ei 10.1.	5.3. Mean	Value is	12.77452	Should Be	10.41K 20
	ISTEST 16 7 7	. 36 14.7	14 6240 - 1500	Paste	d 122/3	CA18 11/18/8	CONTINUAL SHEET U
	TE VARIFICATION AND	Reworked	To Prin	r K	2 Was 12.	TVR	instant
	of 10.7 K	St new pul	4+ P68	n a sin	• 1	if was	- CANTERIA
P	reworked	as well.	No	evs tress	CIA CIA	·	· Gratie
13	reworker	ac wew.	JOD OV	19. FAILED ITEM	HAME P 2	COMPON	[84/Q.
, Ş	20. TOLLOWING REWOR	RINETEST SECURED	2 . 1.0	1 1	()1	508	
15	CAS ARCHEST NO.	17 RECUIRED ESCAUSE	Retesting a	(ready w	riben in pla	nanter	
ENGINE							
•			21.AUTHORIZATION		ORG	DATE	72 CONTINUA
-			٤٠ ١	anted	122-13	אַ אַנאָנויַ וּ	CONTINUA SHEET USE
	23. REWORK/RETEST ACTION TAKEN				,		/neg-one
1 =	R2 and			with componer	<u>nts per 50920 as</u>	sembly pri	4. 110
Į,	Para 4.3	successfully p	cerformed.		· · · · · · · · · · · · · · · · · · ·		ZE COT
٥	28 LIST ALL PARTS REPLACED						110
5	PART NUMBER	CXT SYM P	ART LOT NO DATE O	002 UFR	PROSABLE DEFE	CT .	ANALYSIS NO.
3					ļ <u> </u>		
MANG					<u> </u>		
1					OAG	DATE / - /	
<u> </u>	27 REWORK M. Green	م [©] ارگارک	74 11-18-81 =	E and	ed 122-1		SHEET USE
	30 CAUSS AND CORRECTIVE	Assy compone	nt placement	error. Tis	VALUE CO	THE INS	7311EN
	Rivice w	2 HICHAIR	THAN PRI	NIT COLLE	IT. THIS RE	S15762-1	5 11
	SE 165 111	HA JOK	RESISTOR. TH	F POWER	DISSIPATED	33.FRE CLOS	NPE
	Aciess T	45 PESISTOR	S. VYR	was x	PEDICED THE	12 B	
E	EL1414171A	is THE POS	SIELLITY	02 1/2	STEETS.		1 1
13		SCHNICIANS	HOVE BEL	N CALT	CLED TO	//	J. Me.
S.	CHIEN THAT		ALJES ARE	KITTED	11. CONTINU. SHEET US	15'0m	18 1121
É	12.DOCUMENT IMPLEMENTING	, ·					70 01-1
INGINE EMINGMELIABILITY	34 BASIC CAUSE OF VERIFIED FAILURE	DESIGN ENVIRONMENTAL	TEST EQUIP	MFG. PR	OCEDURE MRING	<i>/</i> . =	UNKNOWN MERCT CODE
1=	L	DEFECTIVE PARTS	TEST SET OF		ANDIP WEAR-O		4+4C1 CODE
	JS.FAILURE SPRI	_	HOWN FAILURE	JE FAILURE CLASSIFIC	ATION CRITICAL MAJOR	SAFET	
	27 ELEGIANSIAN A		2-13 04TE 12/15	31 JESPACECRAPT		1000 2000	
1	THELIANUTY THE	13cmarke 11.	- 13 14/13	A I DAZLEM ENC	Wanter tr. to	マグリ レフアド	V 1476

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F/668
                         ORIGINAL PAGE IS
                                                      11/17/81
                         OF POOR QUALITY
                                                         101
                                                                        SER NO.
                                                                        SET NO.
         SMA HEATER CONTROLLERS
                                           (<u>≤</u> 1.0
(<u>≤</u> 1.0
                                                        mA ) LED IS ON OK (OK)
         + 80 V Line Current
         + 28 V Line Current
                                                        mA)
                                 22.96 mA ( 25 ± 10 mA )
         + 21 V Line Current
                                  2.92 mA
                                              5土
         - 21 V Line Current
                                           (<u><</u>1.0
 4.3.2 + 80 V Line current
                                                        mA )
         + 28 V Line Current
                                10 99 mA (800/1000/1300 ± 150 mA)
         + 21 V Line Current
                                  _23 mA( 25士 10 mA)
         - 21 V Line Current
                                              5土
                                   2.9 mA
         R1 /2-84-51+2 HEATER 27./8 V +2 COMP /. 3 9 V +2 RET . 3 2 V TOGGLE ONOK!
         10:337K PZ REATER 0.0V +Z COMP .27/V +Z RET 28.//V
 4.3.3
         Mean (R1 + R2)/2 10.3 59k \( \text{10.41 K Ohms \pm 84 Ohms} \)
Difference (R1 - R2) \( \text{45 \sigma} \) (210 Ohms maximum)
 4.3.4
                                            (≤ 1.0
         + 80 V Line Current
                                                        mA ) LED IS OFF OU (OK)
 4.3.5
         + 28 V Line Current
                                            (≤ 1.0
                                                        mA)
         + 21 V Line Current
                                             ≤ 1.0
                                                        mA)
         - 21 V Line Current
                                             < 1.0
                                                        mA )
                                            (1.0
         + 80 V Line Current
                                                        mA ) LED IS ON OK (OK)
4.3.6
                                            (4 1.0
         + 28 V Line Current
                                                       mA)
                                   18:65mA ( 25 ± 10 mA )
         + 21 V Line Current
        - 21 V Line Current
                                   2.7 mA (
                                              5 土
                                           ($1.0
        + 80 V Line Current
                                                       mA)
                                 1/30mA (800/1000/1300 ± 150 mA)
         + 28 V Line Current
                                  16.6 mA ( 25 ± 10 mA )
         + 21 V Line Current
                                               5 ± 4 mA)
         - 21 V Line Current
                                   2.8 mA (
         R1 (0.3924)2 -Z HEATER 27.18 V -Z COMP 2.333 V -Z RET .291 V TOGGLE V (OK)
        R2 10.309 K. Q. - Z HEATER 70.001 - Z COMP - 169 V - Z RET 28.14 V
 4.3.8
         Mean (R1 + R2)/2 10.345 k.s. (10.41 K Ohms ± 84 Ohms)
Difference (R1 - R2) 73 7. (210 Ohms maximum)
 4.3.9
                                           (4.1.0
                                                       mA ) LED IS OFF OK (OK)
 4.3.10 + 80 V Line Current
                                           1.0 ک
         + 28 V Line current
                                                       mA )
                                           (≤1.0
                                                       mA )
         + 21 V Line Current
                                            ≤ 1.0
         - 21 V Line Current
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A CONTRACTOR OF THE PROPERTY O

ſ	SIZE	CODE IDEN		NUME	ER	· · · · · · · · ·		
	A	1132	23		162	97	•	
	SCALE		REV	D		SHEET	ઉ	

PART NO.	509		NAME PWB ASSY, Temporature Control	ASSY/LOT SERIAL NO. /O/	1014
OPER NO.	DATE	OPERATOR OR INSP	COMMENTS, TEST DATA, ETC	DISPOSITION	APPROVAL
570	11/18/81	E. Revel	Whift one ley of RZ for a measurement	P.R. Pdrify Value	A FIRM
		到	of its resistance. Refer to FR 1668.	8) R.2'-	Jele
			a Return to test for trouble shooting.		1
	110	Lo.	RETURN TO MEG. ENG.		
	118/8/	Frans	Littled one legist Ro		174
1520	11/18/81	E Agreed	-Rework to post RZ and R68	PR.Mg EC	yaa
	11-18-81	50	both are 12.7% and should be 10.7k.	Skan 9 maile	
	11-18-81	Phiena	replaced R2'4 R68	lang	
520	11/18/81		R Change select nominals as follows:		
			R102 From: 287 St To: 523 JZ		1.
			Risk Fron: 287 & To: 487 52	4:	
	7-7	—	par 10.1.5.3 & spec 16236 -	<u> </u>	
	11/19/21	avely	Beworked above	IGINAL POOR	
1520	11/13/81 (E) Acotest	Change select naminals as follows:		
			R102 From: 523 -R To: 619 D Dev 101.5.3	PAGE	
			R127 From: 487 & To: 590 & spec 16236		
			R 45 From: 18.2K& TO: 17.8KR per 10.16.3		
	11/13/21	quelin	Changed above nominals		
	()	0		
•					
					<u> </u>

(**)

HUGHES AIRCRAFT COMPANY

SPACE AND COMMUNICATION GROUP FAILURE REPORT

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٦		1 PROGRAM NAME HS 236 Th 12 GLA	1. 40DEL		* OESEAVED 1530	S. DATE	72 227	"BO
	ļ	A MADICIDADE LEVEL . COMACECEAST COMPENSTEEN		CEE MOLY	☐ ×oovus		CARD	
1		MAS DESERVED SYSTEM URIT	ছে:	JOASSEMEL,Y	MICAM		PART	
		EQUIPMENT IDENTIFICATION: NAME 1. SUBSYSTEM			PART NUMBER	\$/70	WANFUACTU	
		a unit					 	
1			-, -		OG ALL A	101	400	
- 1	-	a DASSEMBLY POST AMP-BBND		2	0904-1 A	101	T/The	
	5	10. MODULE MICAM CARD						
	4	11.0THER	and the second	<u> </u>			<u> </u>	
	5	12. TEST WHEN OCVELOPMENT CUALIFICA FAILURE WAS INSPROCRESS OCCEPTAN		INTEG	RATION M		PERATIONS	
.			PERATURE	MILÍN T	THERMAL VAC	HRS.	AT *	
		14 DESCRIPTION OFFSET LIMITS	CUIT		0-0	ELE	VEN	
		CIPALURE OFFICE	$\alpha \sigma_1 = \alpha \sigma_1$		PEC ON	توسارا		
	.	CHANNELS			Alla tall			
- 1	1	18 TEST 16GG 7 LL 16 ORIGINATOR		<u> </u>	Allo Town	OATE - O	a cal il com	MIA FIOM
ļ.,	4	7 7	NILE	PATT	7 122-4	272-2	7-87 (-000)	ECITAUM OBEU TEI
	.	18 VARIFICATION AND FAILURE ANALYSIS				·		
	ĸ.							
	3	·	•					
	441		10.FAILE	O ITEM NAME				
	2	20 COLLOWING REMORE/METEST REQUIRED This Los hall.		1.1	Fin Park	3 40000	21 1	ee E
기!	Ē	The state of the s	July 1	ALFORE	The state of Color	1 1 1		
	ENGER	Theor WB was respect by SN 10	Land 3	N 10	tolkert flet	cont	ug lug	
1	•		made la	of the	Charles Has Kin	estillite.		
L]	SIGN CONCURRENCE MERCE		Rom	2/2/2	2/1//8	多一品品	TUESD
Γ		A REMORE PROPERTY AND STREET REPORTED AGE	attendo		into Flow	Band	4-7/6	-
1	_	Bondderd and Teste us In	1 Malles	ain to	() / / De	en assa	118	19-8)
- 1	166	of any company lase	1	-			79	
	ON.	The state of the s	· · · ·		· · · · · · · · · · · · · · · · · · ·	•		19-8
	4	ZELIST ALL PARTS REPLACED	t coos 1 w					
	3	PART NUMBER CXT SYM PART LOT NO. DAT	1 CO00 4	-	MOSABLE DEFEC	<u> </u>	AHALYSIS M	o
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SPACE AND COMMUNICATION GROUP EQUIPMENT CHECKOUT FAILURE REPORT CONTINUATION SHEET

ORIGINAL PAGE IS OF POOR QUALITY

F/76/

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SPACE AND COMMUNICATION GROUP FAILURE REPORT

	-00	GRES AIRCHAP! COMPANY
ſ		1 PROGRAM NAME H 5 236 2 GLA 1. MODELFLIGHT " DISSERVED \$ 30 SEERVED \$ 25 80
-		A MARIDMARS LEVEL SPACECRAFT SUGSYSTEM ASSEMBLY MODULE CARD
	-	WAG OCCUPATION: NAME PART SUBASSIMOLY MICAM PART EQUIPMENT IOSTITIFICATION: NAME PARTNUMEER SIN VANGUACTUER
		7. SUGSYSTEM
		g umy
١		B. CADEMBLY CONDACTEMBLY BAND 4 POST AMP
		12 1 MODULE 1 MICAM DECARD 50964-23 201 HAC
	DRIGNATOR	11.OTHER
	GRIG	12 TEST WHEN DEVELOPMENT QUALIFICATION INTEGRATION LAUNCH OPERATIONS ARLUNE WAS OASSENVED IN-MOCRES SYSTEM
		13) ENVIRONMENT AMBIENT RADIATION TEMPERATURE THERMAL VAC HES AT OTHER MAD ORTHOR TYPE TOTHER
		14. DESCRIPTION CILL WELL SCHOOL SCHOOL STREET
-	- 1	7.2 DB WHEN VOL IS DISCONNEGED S. DB WHEN VOT IS DISCONNEGED.
		SHOULD BE 6 = 0.5 DB.
١		15 TEST DURG 6368 4AAA 6 16 DAIGHATOR NILE PATTY 27 13 2 TEZ 6-80 CONTINUATION SHEET USA
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ł	٦	2. REWORK/RETEST ACTION FAREN
		U3 Repliced and the Tested per 16368 Pag 43.6
	100	710
	AND.	16368 ON 4-1-80.
Ì	HING	ALIST ALL PARTS REPLACED ANALYSIS MO. DATE CODE WAR PROBABLE DEFECT ANALYSIS MO.
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		27. REWORK ORG DATE ZARETESTED ORG DATE CONTINUATION SY
1		10 CAUSE AND CORRECTIVE ACTION
-	Ì	de allacet mino HS-236-6824
-		HYRUN TISSES ACCEPTANCE TEST PROCEDURE BUT FAILS 13, FRECLOSURE
1	Ì	TO PELFORA PLOPERLY IN CIRCUIT, SUSPECT BUILDUR 1/ 1
- (=	OF TOLERANCES. = CHANGE OF HYBRID
	4	CORRECTS CIRCUIT ANOMALY.
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		32.OOCUMENT IMPLEMENTING CORRECTIVE ACTION
기	I MLINE	34 BABIC CAUSE OESIGN TEST COUIP MFG, PROCEDURE WIRING ERROR DUNKNOWN 24 VERIFIED ROUGH HANDLING OFFECT CODE FAILLINE ENVIRONMENTAL TEST PROC. ASSYIFAGERROR ROUGH HANDLING OFFECT CODE
-	-	DEPECTIVE PARTS TEST SET-UP WORKMANSHIP WEAR-OUT
		13. FAILURE PRIMARY DINKNOWN SAFETY /
		11 PESONSIBLE / MIL BONDA 12 30 21-23 34 6/25/80 14 PACECRAPT / MUNCHEL SPACE 3/6/25/80
	•	19. MELIAGINATE OF A SUPPLIER
,	18	73 SC JUL 7



SANTA BARBARA RESEARCH CENTER A Subsidiary of Hughes Aircraft Company

F1769

INTERNAL MEMORANDUM

Distribution

CC:

ORIGINAL PAGE IS DATE: 15 May 80 OF POOR QUALITY

HS-236-6824

REF: REY 80/21

FROM:

SUBJECT: Failure of Hybrid Postamo S/N 84

TLR5 MAIL STA. 17 BLDG.

2597 EXT.

FR F1769 Hybrid Postamp P/N 50859-4 (HAC P/N 1950588-100) S/N 84

This hybrid failed during test of the Band 4 postamp PWB P/N 50904-4 S/N 201. Failure mode was "fails single ended output test S/B -6 ± 0.5 db. is VOL disconnected = 7.2 db VOH disconnected = 5.1 db". When tested at Fullerton to the acceptance test procedure the device tested acceptable. I requested that a 100Hz signal be applied to the failed channel and VOH be disconnected after a reference point was determined. This duplicated the card level test that the device failed at SBRC. The test results are as follows:

VOH disconnected = loss of 5.5 db.

VOL disconnected = loss of 6.5 db.

This is very close to the readings recorded at SBRC when the tolorance of the monitoring equipment is taken into consideration. The readings at Fullerton were, in any event, at the limit of the established tolerance of I 0.5 db. There does not appear to be a specific test that is an equivalent of the single ended output test performed at SBRC. A concensus of opinion is that the common mode rejection test performed at the hybrid level is the same type of test, but there appears to be some question concerning the allowable tolerance.

Mike Slonaker is looking into the details of the test method and parameters. No further analysis is considered necessary at this time. The device was not delidded and is presently being held by SBRC Reliability pending resolution of the failure report.

> M. R. Head M. R. Heath

TM Reliability

/tkh

Distribution:

- L. Altman
- S. Branda
- R. Cooley D. Randall
- C. Rodil
- M. Slonaker
- P. Tannous
- L. Wolthausen

System Test Data Library (11 copies)

۲	THEMATIC MAPPER	HUCHES AIRCRAFT COMPANY DATE: 12/3/19			
l	1950588-100	MICROELECTRONIC PAGE 1 OF 2	_ 		
I	P/N: 50859-4	TEST DATA SHEET P.O. No.			
	Date Code & S/N 4679-84	POST AMPLIFIER SPEC NO.: R	_		
	ORIGINAL PAGE IS Paragraph No Results OF POOR QUALITY				
		Pre Burn-In Final Elect. Limits & Conditions			
:	13.1 Power	CHA CHB CHA CHB			
	1 +15	1.67 ma 1.61 my 1.68 ma 1.01 ma < 2 ma			
	I -15	1.67 ms 1.60 ms 1.69 ms 1.52 ms < ? ms			
	13.2 Preamp Bias				
	PL	4.95 y -4.93 y -4.95 y -4.93 v -5 + 10% volts			
	13.3 Input Balance				
	111 + IL	0.5 m 0.4 m 0.6 m 6 day. 3.0 HV p-p 100Hz -			
.	13.4 Low Frequency				
	CH - OL 160Hz	9.5 de 9.3 do 9.5 de 9.7 ± 1 ct			
	0H + OL	43 de -31 de -42de -31 de Min20st below Ul - 1	K		
	13.5 Frenuency Resp	nse and			
	13.6 Common Mode Re	<u>ection</u>			
4	OH - OL SKHZ	4.2 dB 4.2 dB 4.2 dB 4.4 dE +4/+5db ref.100Hz Sain			
	OH + OL	36 de -32 do -35 do -311 se Man20 do below OH -	01		
	UI: - OL 10KHz	8.5 16 8.3 18 5.7 18 8.518 +8/+10db ref. 10%1: Ga	ir		
	0H + OL	2: dB -33 db -35de -33de Min29db below 0!! -	C!		
	OH - C1. 20KHz	14.0 da 13.8 dc 14.100 13.8 db +13/+15db ref. 10.112 Ga	iı		
	CH + OL	-38 de -36 de -38 de -35 de Min20 de below OH -	0		
		18.7 de 18.4 de 18.900 126de +17/+20dh ref. 100iiz Ga			
	OH + OL	-28 ac -33 ac -29 de -33 de Min20 de below in -	0		
	OH - CL 50KHz	18.8 18.5 18.5 19.146 18.846 +17/+20db ref. 100th Sa			
	OH + OL	-25 do 1-32 de -25 de -31 de Min20 de helou C	Ç		

Contractor Contractor

HENES AIBCRAFT COMPANY MICROELECTRONIC PART NO. 1950502-100 FULLERION CALIFORNIA TEST DATA SHEET DATE: PAGE 2 OF S/N: F1769 Limits & Conditions Paragraph No. Pre Burn-in Final Elect. 13.5 and 13.6 (cont.) OH - UL 60KHz 17.6 do 17.3 dB 17.8 db 17.5 dB +15/+19db ref. 100Hz Gain OH + OL -24 db -33 db -24db -33dB Min. -20db below CII - OL OH - OL 100KHz 8.1 48 7.6 db 8,2 de 7.7 db +1/+10db ref. 100Hz Gain OH + OL 100KHz - 23 dC - 32 dB - 23 dB - 34 dB Hin. - 29 db below CH - OL 13.7 Supply Voltage Rejection OH - OL (+15V) 9 av 9 - 8 - 100 617 0-0 OH + OL (+15V) /1 - 12 - 1/ +v /2 - 100 mv p-p OH - OL (-15V) 8 - 7 - 7- 7- (100 miv p-p OH + OL (2151) 2 an 2 av 2-v 100 mv p-p 13.8 D.C. Offset -16 -1 -5 av 19 mv -8 mv 0 + 3:0 mv 1/3. 0н 18 mg 12 mg 20 mg 14 mg 0 + 340 mg nax. OL. 13.9 Roll off Terminal Check 12.96 - 15.46 Terminal 56 & 47 13.63 KZ 13.60 KJ 12.9K - 15.4K Terminal 41 & 33 13.65 Kz 13.63KM

> ORIGINAL PAGE IS OF POOR QUALITY

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Tested by: The Server	pt	
Quelity/Responsible Engineer:k	Tunsta_	CMULLEUS 38R. 12.12.79

THEMATIC MAPPER	HUGHES AIRCRAFT COMPANY	1 DATE: 4-9-80
1950589-100	MICROELECTRONIC	race 1 or 2
P/N: 50859-4	TEST DATA SHEFT	P.O. 110.
Date Code & S/11 84 4679	POST AUPLIFIER	SPEC NO.: 16075
Paragraph No.	Results OF POOR QUA	E IS F1769
	Pre Burn-In Final Elect.	Limits & Conditions
	СНА СНВ СНА СНВ	
13.1 <u>Fower</u>		
1 +15	6711× 1.6/0:2	< 2 ma
1 -15	67 ma 1.60 ma	_ < 2 ma
13.2 Preamp Bies		
ΓL _4	1.19v -4.98v	-5 + 10% volts
13.3 Ingut Balance		
111 ÷ 11	64V O.dny	. 3.0 mv p-p 100Hz -
13.4 Low Frequency 65		100kHz max.
	17.565 19.365	
OH + OL - 4	15144 -31144	min29ab below on -
13.5 <u>Frequency Respor</u>	so and	
13.6 Common Mode Reje	ction	
OH - OL SKHZ s	14.5do 14.21B	_ +4/+5dh ref.100Hz Gain
•	3816 -3315	Nin20db below OH -
	49.10E +9.00B	+8/+10do ref. 100Hz Ga
'	3825 - 3425	Min2046 below OH -
	14.506 114.46	- +13/+15db ref.100Hz Ga
		Min20db below OH -
	381B -361B	-
•	19.400 119.000	_ +17/+20db ref.100Hz G
	2916 -3312	Min2905 below OH -
OH - OH BOYHE Z	119 Edg 419.3KL	+17/-2006 ref.100Ha S
स्यात्राम् ।	25de - 32de 1	Man . s ob hel a fill .

101111	ION CALIFORNIA	MICROELECTRONIC TEST DATA SHELL	PART NO. 1950503-100
S/R:	, .1		PAGE 2 OF 2
			F1769
	Paragraph No. Pre	Burn-in Final Elect.	Limits & Conditions
13.5	and 13.6 (cont.)		
•	011 - OL 60 KJIZ 4/8.24	3 +18.043	+15/+19db ref.100liz Gai
•	OH + OL -24d3	-3216	Hin20db below OH - C
	011 - OL 100KHZ +8.98	48.566	+1/+10db ref. 1000z Gai
	OH + OL 100:11= -24de	-2246	Min20db below OH - C
13.7	Supply Voltage Rejecti	Öu	
	OH - OL (+15V) 2mg	8' AIV	<100 mv p-p
	OH + OL (+15V) 10 ml	10 mV	<100 mv p-p
	OH - OL (-15V) Env	_ 7mV	<100 mv p-p
	011 + OL (-15V) 2 m/	_ 201	<100 mv_p-p
13.8	D.C. Offset		
• · · · •	011 -16 mu	-511V	0 + 340 mv max.
	OL +1700	413111	0 + 340 mv max.
13.9	Roll off Terminal Chec	<u>:k</u>	
	Terminal 56 & 47	ntere anno desar a susana de ser a ser	12.9K - 15.4K
•	Terminal 41 & 33		12.9K - 15.4K
	•	ODIOMAS DALL	

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Cuality/Responsible	Engineer:	

PART NO.	50904-	4	PART (UB. asy Lostomplifies) 1-4	ASSY/LOT SERIAL NO. 20/	Tour
OPER NO.	DATE	OPERATOR OR INSP	COMMENTS, TEST DATA, ETC	DISPOSITION	APPROVAL
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V				Proceed toops 2002	mesac
500	3-25-80	Miratty	FAILED TEST 4.3.6 (CH,7) EXCEEDS 6.0 ± 45 DB, 15 7.200	7-,	
		/	WHEN VOL DISC., S. I WHEN VOH DISC. SEG 1769 gratimin		_
500	3-24-80	R. BACL	REPLACE Foiled (US) 50859-4 post-AMP Moveid.	REE FAILURE REPORT 1769	
			to two per suprostoriou to seem trybaid for	REPLACE US AND RETEST	7.20
	3.57.80	Ming	replaced about 5	70 16368, PAR 43.6	
		778		Barton horn	5 4.6
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5.1	77			House & Ray	
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SBRC ASSEMBLY HISTORY RECORD CONTINUATION SHEET SHEET 5 OF 9 PART NUMBER SERIAL OR LOT NUMBER ASSEMBLY NAME CONTINUATION OF: AHR DATED 3-3-80 AHR SUPPLEMENT NO. 20 50904-4 PWB AYSY POSTAMPLIFIER 1-4 **ÖPER** SIC PERFORMED BY INSTRUCTIONS REMARKS NO. NO. OPER INSP DATE NOTE: Notify QA & AF prior to start of testing. 3-25% PANA 4.3.6 (11.7) 11. Patty 200 22-13 1) Perform initial circuit test at ambient temperature per Spec 16368. 2) Perform Electrical test per Spec 16597. Para 4.0 3) Select components using Spec 16597 & per B/P TESTED ON Matt note 16 6 23. 4-1-80 4) Record selected values on test data sheet with traceability. ORIGINAL OF POOR SEE MASTER PLAUNING DATED CONFINUATION. PAGE IS 8.00 2-14 Kit and enter traceability of selects R1-R16, R17-R32, R65-R80, R81, R96, C33-C48 and C57-C72 or ABC/TI from test data sheets and MR. 900 31-11 Inspect selects.

DEREMONE

HUGHES

SPACE AND COMMUNICATION GROUP FAILURE REPORT

1	ı	PROGRAM NAME HS 2	36 1	79 2 64	3. 44	DOSL EL	OBSERVED 2 PM	S. CATE DOSERVED	\$ 62 62					
l	ſ	6. HARDWARE LEVEL MIEN FAILURE WAS CREENVED	- PACECRAFT		YSTEM	ASSEMBLY	woould		ZZ CARD					
1	ļ	HAD CREENVED [SYSTEM	URIT NAME		CUBARSEM	PART NUMBER	. JAN	MANFUACTUER					
	Ì	7. SUBSYSTEM		·	·									
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	ł	B. ASSENCLY SUBACIONE	LY .						<u> </u>					
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1 5	}		SEVELOPISMT		ALIFICATION		TEGRATION	7	PERA FIORS					
l°	1	AAIL HOS WAS	N-PROCRESS		CEPTANCE		STEM							
	1	13 ENVIRONMENT	AMBIENT C	RAGIATION C	TEMPERATURE .		- THERMAL VAC							
1	1		EMC/RFI C	VIBRATION	AXIS FOR	MAIN .	TYPE							
	-	FOR MAY BOOST ABOVE THE 100 HZ CAIN												
1	Į	FOR MAY BOOST ABOVE THE 100 HZ GAIN												
1	ŀ	TEST STORM 16368 LIANS 3 ISCONIGNATION A D. TO ONG 3 26TE CA LICOSTINUATI												
_	1	** PROCEEDURE 16368	47	3.8 ILORIGIN	ATON N. PA	777	72 13	56-5	CONTINUATION SHEET US					
	l	18 VARIFICATION FOR THE WILL BE RESULVED BY CHARLING												
١,	·	FOLERANCES IN TEST PERCENCE 16368 PARCEAPE 4.368												
14	ĺ				•									
1	Ī	•				19. FAILED ITEM M	AMS GER							
	ľ	20. C FOLLOWING REMORK/RETES	ST RECUIRED	RESOLUTION	·			2194127	Ru CHALCIO					
	1	TOLERANCE OF TP. 14 368 PAR 4.3.8 VATH AN 2.0.												
NGINE	ŀ	TOLERFACE OF	16 36	B MA 4.	1	77	9.		حد بری داده چه و ۱۳۰۰ به در					
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1 2		PROBLEM.							25.QA RETEST					
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HUGHES HUGHES AIRCRAFT COMPANY

SPACE AND COMMUNICATION GROUP FAILURE REPORT

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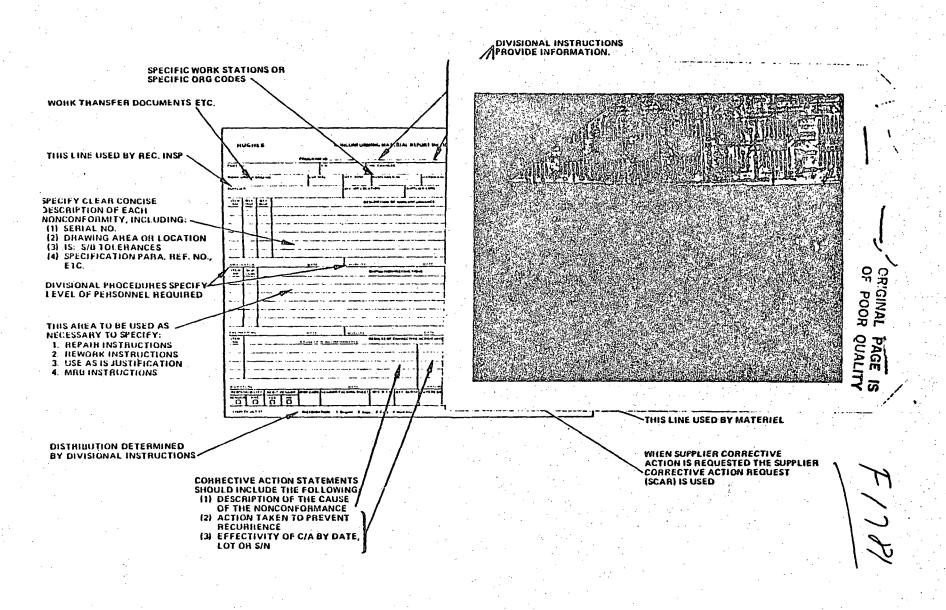
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SPACE AND COMMUNICATION GROUP

FAILURE REPORT,

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FORMS INSTRUCTIONS FOR FORM 11628 CS (COMPLETE ONLY APPLICABLE BLOCKS)



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MATERIAL REVIEW CONTROL ORDER

CONTINUATION SHEET

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ORIGINAL PAGE IS OF POOR QUALITY MRCO MATERIAL REVIEW CONTROL ORDER PART NO. 5/795 REVISION PART NAME MACRO DISCRETE NO 1 PWB QUANTITY / S/N 102 ROUTE TO: RM 5322 P.O. MASTER CLEARED OPR QTY QTY INSP DATE INSTRUCTIONS 5/c COMMENTS NO. ACC SUS OPER REMOVE HEATSINK STACK PUB6/19/80 DUTERMIN CHUS 4/CA LUSPECT AND IDENTIFY CHIL LAHAMERAX 425 AUG 2 1 1980 SHORT Uit Byen 8/21/80 REMOVE JAORT 300 AUG 2 1 1980 400 LUSDECT INSUFFICENT PWI थ्र भू MCT 500 INSTRUCTIONS A CLEMING & BONDING THE SEE CONTINUATION FOR ADDITIONAL 400 DON'S HEALTING TO HRS MIX NO. 700 RETURN THIS CARD TO MATERIAL REVIEWS FOR THE REGORD CLEARANCE D LAST (1107) OPR SB 0344-B-1 FEB 78 QA APPROVAL MINAL DATE 6/10 ENC APPROVA

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SENDS ALTERNATING BIT FATTERN TO
BOARD AND VERIFIES PROPER OPERATION

ENTER OPERATOR DATA, YES OR NO ! N

PRINT VERIFICATION ERRORS, YES OR NO ! Y

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CURRENT CYCLE COUNT IS : 0000000050

CURRENT ERROR COUNT IS: 0000000000

MONITOR

T3
TEST PROGRAM NO. 3 ----> MACRO DISCRETE CMD. TEST - CH #1
SENDS ALTERNATING BIT PATTERN TO
BOARD AND VERIFIES PROPER OPERATION

ENTER OPERATOR DATA: YES OR NO ! Y.

ASSY. NO.: ---- 51795

CARD NAME: ----- MACRODISCRETE CMD GEN +1

SERIAL NO.: ---- 102

DATE & TIME: --- NOV 15 '81 9:11

PRI. OF RDT.: --- RDT

TEST OPERATOR: -- J BANACH

OTHER TEST

CONDITIONS: ---- LIFE CYCLE TESTING AT AMBIENT (RDT)

TO START TEST EXECUTION PRESS "G" KEY.

(TO TERMINATE TEST PRESS "ESC" KEY.)

PRINT VERIFICATION ERRORS, YES OR NO ! Y

CURRENT CYCLE COUNT IS: 0001011026

CURRENT ERROR COUNT IS: 0000000000

- - TESTING COMPLETED - -

DATE & TIME: ---- NOV 17 /81 8:05

PRI. OR PDT.: --- RDT

TEST OPERATOR: -- J BANACH

OTHER TEST

COMBITIONS: ---- LIFE CYCLE TESTING AT AMBIENT (RDT)

HH>>5=9%G=IURT>>>5RZ>WHH>>>5=9%G=IURT>>>5RZ>>

MONITOR

T3
TEST PROGRAM NO. 3 ---> MACRO DISCRETE CMD. TEST - CH #1
SENDS ALTERNATING BIT PATTERN TO
BOARD AND VERIFIES PROPER OPERATION

ENTER OPERATOR DATA, YES OR NO ! Y

ASSY. NO.: ---- 51795

CARD NAME: ----- MACRO DESCRETE CMD GEN #1

SERIAL NO.: ---- 102

DATE & TIME: ---- 13 NOV 181 10:07

PRI. OR RDT.: --- PRI

TEST OPERATOR: -- J GUYTON

OTHER TEST

CONDITIONS: ---- LIFE CYCLE TESTING AT AMBIENT (PRI)

TO START TEST EXECUTION PRESS "6" KEY.

TO TERMINATE TEST PRESS "ESC" KEY.)

PRINT VERIFICATION ERRORS, YES OR NO ! Y

CURPENT CYCLE COUNT IS : 0001007810

CURRENT ERROR COUNT IS : 00000000000

- - TESTING COMPLETED - -

DATE & TIME: --- 15 NOV 181 8:56

PRI. OR RDT.: --- PRI

TEST OPERATOR: .-- J BANACH

OTHER TEST

COMDITIONS: ---- LIFE CYCLE TESTING AT AMBIENT (PRI)

F1781

ORIGINAL PAGE IS OF POOR QUALITY SANTA BARBARA RESEARCH CENTER A Substitive of Husbal August Company

INTERNAL MEMORANDUM

TO: L. O'Connell

OC: Distribution

DATE: December 8, 1981

REF: ES236-7762

RE/AH 81/66

FROM: A. Huber

SUBJECT: Failure Report, F1781 (Macrodiscrete Command Generator Board No. 1, F1t)

BLDG. B11 MAIL STA. 102

EXT. 6246

FR: F1781, dated 5/8/80

The failure was encountered during board test of the macrodiscrete command generator No. 1 board (assy. No. 51795), with the board hear sink place mounted to the board. It was found that three outputs (pins 2, 6, and 10) of flatpack U35 (54L04) were shorted together. The short-circuit was not visible on the top, component-side of the board; x-ray photographs of the board revealed the short-circuit to exist on the bottom-side, and to consist of an extraneous interconnecting trace. The hear sink was removed to accomplish the repair. After the repair was made the board functioned properly. It is believed that no overstress occurred and that replacement of U35 is not warranted.

The three outputs which were shorted together are designated U35B, U35C, and U35E and are shown in Figure 1. Two of the outputs (designated 'enable'; U35B and U35C) have an identical input signal and produce identical output signals; they function to strobe data into the register shown in Figure 1 upon receipt of an enable signal. The third output signal produces a reset signal to reset the register upon completion of processing. All three outputs are normally in the high-state.

when the board is tested and a macrodiscrete command is issued by the test set, an enable signal is issued, causing the outputs of U35B and U35C to go to the low-state, as shown in Figure 1, case A. Since the reset signal (U35E) is in the high state, the two enable outputs attempt to pull the reset output to the low-state. The resulting maximum stress is that of having one output shorted to signal ground. This is not a condition of overstress; the manufacturer states that one output can be shorted-circuited to signal ground indefinitely.

The test set issues enable signals (70 microseconds in duration) at 100 millisecond intervals. Approximately 40 milliseconds after the occurrence of an enable signal, a reset signal is issued. The reset signal cuases the U352 output to go to the "low state", as shown in Figure 1, case 3. Since the two enable outputs (U353 and U35C) are in the high-state, an attempt is made to pull the enable outputs to the low-state. The resulting theoretical maximum stress is that of having two outputs in the same flatpack, short-circuited to signal ground.

FITAL

Memo to L. O'Connell 12-8-81 Page 2

ORIGINAL PAGE IS OF POOR QUALITY

The maximum short-circuit output current of a 54L04 is 15 ms. For two outputs short-circuited to signal ground the total current is 30 ms. It is believed that 30 ma (plus am additional 4.32 ma of loads from gates connected to the three outputs) is beyond the sink current capability of U35E, which has a guaranteed capability of at least 2.0 ma. However, if U35E is capable of this current, the resulting stress would not be excessive. For example, the maximum additional power increase with two outputs short-circuited (neglecting the 4.32 ma of external loads) is 150 mg (50 x 30 mg). For an assumed thermal resistance of 150° C/W, junction-to-embient, the maximum increase in junction temperatures would be +22.5°c, resulting in junction temperatures of +45.5°c (+22.5°c temperature rise above a +23° c ambient). Since the part 1s capable of operation at +125°c, the resulting stress would not have been excessive.

Distribution: Altman, L. Banach, J. Barnert, G. C. Day, J. G. Evans, D.

HUGHES

SPACE AND COMMUNICATION GROUP

FAILURE REPORT

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Hughes

SPACE AND COMMUNICATION GROUP FAILURE REPORT

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HUGHES AIRCRAFT COMPAN

SPACE AND COMMUNICATION GROUP FAILURE REPORT

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SANTA BARBARA RESEARCH CENTER A Subsidiery of Hughes Aircraft Company

INTERNAL MEMORANDUM

TO: O.I. Nakano

CC: D. Adams

DATE: 1 February 1982

L. Altman

REF: PE 15:82

SUBJECT: Failure Reports F2723,

F2724 and S8951

FROM: L. O'Connell

51-41

BLDG. B-11 MAIL STA. 39

EXT. 6357

This is to confirm our Tel-Con of February 1,1982 regarding subject Failure Reports.

As I stated to you all three Failure Reports were written against the same printed wiring board (P/N 50916, S/N 201). The cause of the test failures in each case was the installation of an incorrect resistor.

Contract quantities of subject boards have been completed. However, to help you preclude reoccurrence of this type of discrepancy on future orders or current production, copies of subject Failure Reports are attached so you can discuss the problem with Responsible Manufacturing Supervision.

L. O'Connell, Manager

Administration and Reliability Thematic Mapper Program

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HUGHES AIRCRAFT COMPANY

SPACE AND COMMUNICATION GROUP FAILURE REPORT

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SANTA BARBARA RESEARCH CENTER A Subsidiery of Hushes Aircreft Comsume

INTERNAL MEMORANDUM

O.I. Nakano

D. Adams L. Altman DATE: 1 February 1982

REF: PE 15:82

FROM: L. O'Connell

51-41

BLDG, B-11 MAIL STA

EXT. 6357

SUBJECT: Failure Reports F2723, P2724 and S8051 ·

> This is to confirm our Tel-Con of February 1,1982 regarding subject Failure Reports.

As I stated to you all three Failure Reports were written against the same printed wiring board (P/N 50916, S/N 201). The cause of the test failures in each case was the installation of an incorrect resistor.

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L. O'Connell, Manager

Administration and Relfability

Thematic Mapper Program

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ORIGINAL PAGE IS OF POOR QUALITY FAILURE DEDOOR NUMBER AIRCRAFT COMPANY SPACE AND COMMUNICATIONS GROUP EL SEGUNDO, CALIFORNIA

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	8 UNIT						·
_	9. ASSEMBLY SUBASSEMBLY						
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SANTA BARBARA RESEARCH CENTER A Subsidiary of Hughes Aircraft Company

INTERNAL MEMORANDUM

5 8049

TO: L. O'Connell

CC: Altman, L.

DATE: 12 November 1981

Banach, J.A.

REF: HS236-7718

Barnett, G.C. Day, J.G.

REAH 81/59

SUBJECT: FR: S8049 (Scan Line

Evans, L.B.

FROM: A. Huber

Corrector Board, Flight)

Wolthausen, L.H.

BLDG. B-11 MAIL STA. 102

Data Bank

EXT. 6246

FR: S8049, dated November 6, 1981

The failure occurred when performing optical/electrical calibration of the scan line corrector subassembly, with the scan line corrector board (assy. no. 52250-1, S/N 201) mounted in the SLC test box and receiving ±19V power (actually +21V) from a power supply within the test box. At the time of the failure two (2) oscilloscope probes were attached to test points at the top of the board and signals were being monitored on the oscilloscope display. The SLC motor and mirrors were in operation. With the occurrence of the failure the display went blank and SLC motor/mirror operation ceased. It was estimated that test equipment power was turned OFF within 15 seconds of the occurrence of the failure.

Investigation of the scan line corrector board found the ground lead of an oscilloscope probe in contact with the +19V on the SLC board, shorting the test equipment +19V power supply to signal ground and causing the +19V fuse (3 amp) to open. Figure 1 illustrates the point at which the short occurred (pin 4 of relay K3). Measurement of the resistances from (through) the SLC connector pins, to the input of relay K3, indicated nearly identical resistances for the '+19V'and'-19V' lines (0.061 ohms, connector pin 22 to relay pin 3; 0.058 ohms, connector pin 23 to relay pin 2). Measurement of the contact resistances of K3 indicated 0.013 ohms (pin 3 to pin 4) versus 0.010 ohms (pin 2 to pin 5). Subsequent testing of the board after the fuse was replaced (and before any components were replaced) revealed no change in board performance as a result of the failure.

Four components were eventually replaced: (1), relay K3; (2), voltage regulator U2; (3), voltage regulator U1; and (4), resistor R14 (6.49 ohms, 2w, 1%), appearing on motor driver assembly 54018, part of SLC board assembly 52250.

Relay K3 was replaced because of the possibility that the short circuit surge current from the 27,000 μ fd power supply capacitor caused some degradation of the relay contacts.

Voltage regulator U2 (LM125) was replaced because of a possible overstress of Q12 within U2. This component, O12, has a capability of approximately 30ma to 40ma (National Semiconductor, Tim Reagan, 408-737-5000 x 3887) and may have experienced a surge of 450 ma, depending upon the position of the SLC motor at the time of the failure. A second reason for replacement of this part was the possibility of excessive input voltage (greater than 30V) due to an inductive transient from the short circuit surge current. This latter possibility was also the reason for replacing the other LM125 voltage regulator, U1.

The resistor R14 (6.49 ohm, 1%) was replaced because in the presence of a short circuited +19V, the SLC motor driver produces a steady-state output as shown

FR:S8094
A.Huber, to L. O'Connell

HS 236-7718
Page 2

in Figure 2, resulting in a power dissipation of 2.5 ω for R14. This component has a manufacturer's rating of 2ω .

All other components of the SLC board were analyzed for possible overstress. No other components (other than the four that were replaced) were found to have been possibly overstressed.

A. Huber

AH:jc

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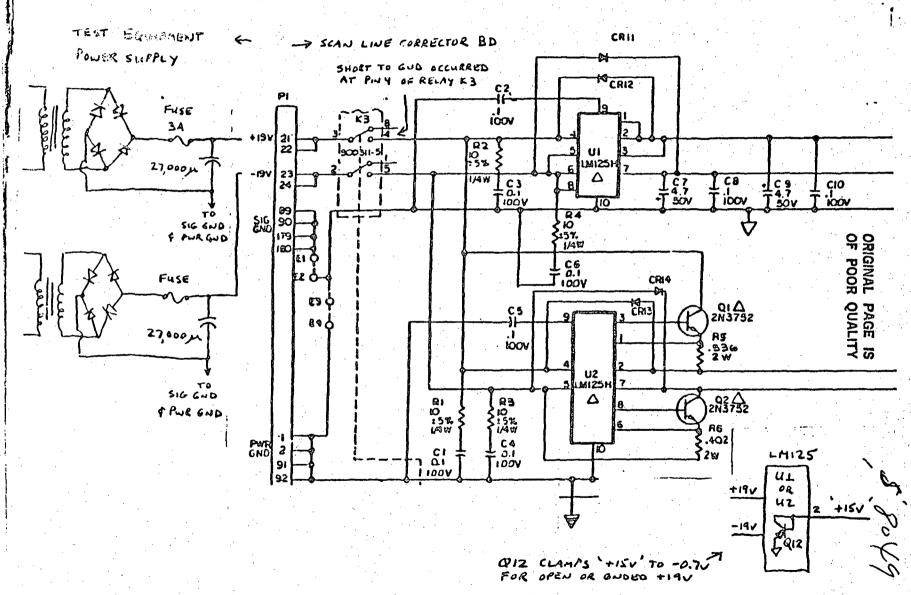


FIGURE 1. SLC #19V POWER INPUT CIRCUITRY , ILLUSTRATING POINT AT WHICH FAILURE OCCURRED

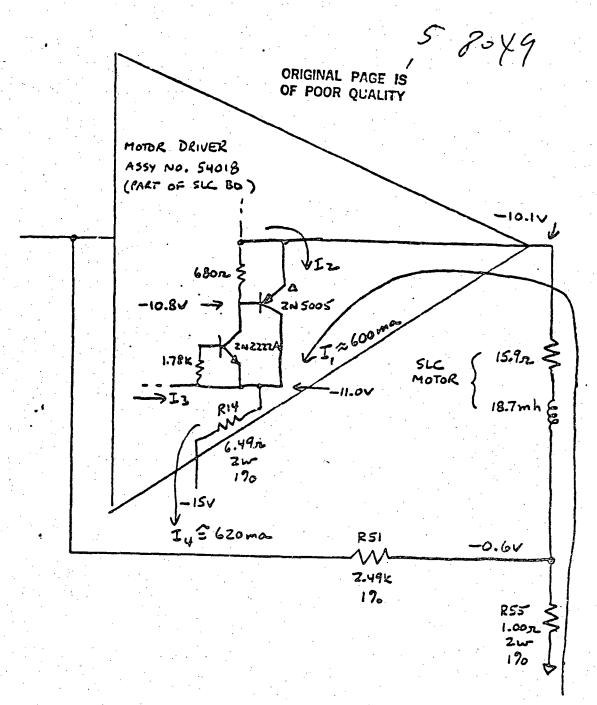


FIGURE 2. MOTOR DRIVER STEADY-STATE OUTPUT FOR +190 SHORT TO GND

4.5.1 Track Rate, Linearity, and Overlap/Underlap
FINAL LINEARITY DATA

5 80×9 , 11/1-/51

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ET. MO. DUNT MEAN	2 ERROR 1764.96COUNT	FRACT.+ 5.93 MAX 1765 C	HIM THUD	1764 CF	IT STD DEV	. 1
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ET. NO. DUNT MEAN	5 ERROR 3700.8408UNT	FRACT.+ 4.38 MAX 3701 C	NIM INUO	3700 C1	IT STD DEV	.3
ET. NO. DUNT MEAN	6 ERROR 4257.99COUNT	FRACT.+ 4.19 MAX 4258 0	DUNT MIN	4257 CI	HT STD DEV	4.6
ET. NO. DUNT MEAN	7 EPROR 4882.04COUNT	FRACT.+ 3.92 MAX 4883 C	nIm Th∪⊡	4882 CI	HT STD DEV	4.9
ET. NO. DUNT MEAN	8 ERROR 5570.99COUNT	FRACT.+ 4.23 MAX 5571 0	NIM THUO	5570 Ot	HT STD DEV	
ET. NO. OUNT MEAN	9 ERROR 6120.06COUNT	FRACT.+ 4.51 MAX 6121 0	MIM THUD	6120 C	NT STD DEV	.2
ET. MO. DUNT MEAN	10 ERROR 6759.24COUNT	FRACT.+ 5.15 MAX 6760 0	חוא דאטם	67 5 9 Ct	HT STD DEV	.4

SCALE	REV	A SHEET 8
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SIZE	CODE IDENT NO	NUMBER

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4.5.1 Track Rate, Linearity, and Overlap/Underlap

FINAL LINEARITY DATA

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ET. HO. DUNT MEAN	5 ERPOR 3700.84COUNT	FRACT.+ 4.38	S COUNT MIN	3700	CHT	STD DEV	
ET. NO. DUNT MEAN	4258.950DUNT	FRACT.+ 4.25 MAX 4259	3 COUNT MIN	4258	CHT	STD DEV	
ET. NO. QUNT MEAN	7 ERROR 4882.04COUNT	FRACT.+ . 3.96 MAX 4883	2 COUNT MIN	4882	CNT	STD DEV	•
ET. NO. DUNT MEAN	6 ERROR 5570.04COUNT	FRACT.+ 4.15 MAX 5571	5 COUNT MIN	5570	CNT	STD DEV	5.
ET. NO. HABM THUC	9 ERPOR 6120.98COUNT	FRACT.+ 4.59	e COUNT MIN	6120	CNT	STD DEV	3.
ET. NO. DUNT MEAN	10 ERROR 6759.97COUNT	FRACT.+ 5.28 MAX 6760	2 COUNT MIN	6759	CNT	STD DEV	•
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SIZE	CODE IDENT NO	NUMBER
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HUGNES AIRCRAFT COMPANY
SPACE AND COMMUNICATIONS GROUNDS
EL SEGUNDO, CALIFORNIA

FAILURE REPORT

٠	EL SEGUNDO, CA	LIFORNIA				7.7	· · .		•
	1. PROGRAM NAME AT	PL/162	2 GLA	11	1. MODEL	3.	SERVED	S. DATE OBSERVE	20 YR 8/
	8. HARDWARE LEVEL WHEN FAILURE WAS OBSERVED	SPACECRAFT SYSTEM	C SUBSYSTEM		SSEMBLY UBASSEMBLY	MICAM		CARD PART	
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	8. UNIT	··			<u> </u>				
· (e	9. ASSEMBLY	SUBASSEMBLY							· · · · · · · · · · · · · · · · · · ·
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E	II. OTHER								
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ā				ORIZATION	·	·	888	STAD	122 CONTEQUATION
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	30. CAUSE AND CORRECTIVE ACTION	CAUSED	· · · · · · · · · · · · · · · · · · ·	LUNE	OF P/	N 912	9ZZ	FET	SWITCH.
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HUGHES

SPACE AND COMMUNICATIONS GROUP

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CONTESSUATION SWEAT LETTER

HUGHED AIRCRAFT COMTANY SPACE AND COMMUNICATIONS GROUP EL SEGUNDO, CALIFORNIA

FAILURE REPORT CONTINUATION SHEET

	*Lagel first continuation sheet used 'a', second 'b', and so on	ADDITIONAL FR CONTINUATION SHEETISI USED
	IDENTIFY ENTRIES BY REFERENCING FR BLOCK NUMBER IN COLUMN, DATE EACH ENTRY.	
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			FR 8050 SELECT RESISTORS R314R32				
			WILL REQUIRE RESELETING 15 FOLLOWS:				
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511527 8 PART NO. ASSY/LOT SERIAL NO. 014 PART PLUB ASSY SCAN LINE CORRECTOR 52250-2 201 OPERATOR COMMENTS, TEST DATA, ETC DISPOSITION APPROVA OR, INSP NO. R32 S/B 2.21 SOLDER NEW RESISTORS TO STANDOFA. Lugaled RACETO 3104 TEST - VERIEY SELECTS 3105 KIT INSPECT INSTALL R34R32 ON PLUR PER BIP 3107 INSPECT SOLPER MCI 3109 12.7.81 RETURN ASSY TO TEST OPER 3150 SUPL#1. ORIGINAL OF POOR PAGE

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NOTES: SAME A	S ORIGINAL		•				

OPER	\$/C		PE	RFORMED	BY.	1
NO.	NO.	INSTRUCTIONS	OPER	INSP	DATE	REMARKS
		REASON; Improper linearity data over tempera-				
		ture test.				
		•				
		PURPOSE: Perform test at 0°C and 50°C for				
		voltage verification.			,	
	·	NOTIFY QA AND AF PRIOR TO TEST		,		1 tified "/2/51
3105	22-13	1) Perform and record the following at 50°C	Y Erran		11/25/81	·
		with 108KHZ out and TP14 at +13V measure				
		and record the following voltages;				
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ShRC		SSEMBLY HISTORY RE	CORD CONTINUATION SI	HEET					SHEET 2 OF 4
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	52250-2	201	P.	RRE	CTC	·	<u> </u>	HIR S	UPPLEMENT NO.
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	Junction of 1	132 and R33 - ২ ა	246 V						
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	2) Repeat wit	th 108KHZ out and T	P14 at -2VRecord.						
	.1	131 and 1132 - 4.6.							
	Junction of }	(32 and k33 - 2 0	n e S v						
	3) Test at 0	C with 108KHZ out	and TP14 at +13V						
	Record.								
	Junction of F	131 and R32 - 2 1/2	<u>i 7 5 V</u>						
	Junction of t	132 and $133 - 2.0$	17: V						
	4) Repeat wit	th 108KHZ out and T	1 ¹ 14 at -2 y Record,	·					·····
	Junction of I	131 and R32 - 2.63	20 Y						
	Junction of E	132 and R33 - 2 00	? 5 v . • .						
	·								
	Becord change	of parts as deter	nined by above test.						
	REPLACE: U	′ / 3	,						
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Shac			ASSEMBLY HISTORY RECORD CONTINUATION SHEET					SHEET 3 OF 4
PART NUMBER 52250-2		52250-2	SERIAL OR LOT NUMBER 201	AN TIME AHR			NUATION OF: DATED SUPPLEMENT NO. 6	
OPER NO:	S/C NO.	INSTRUCTIONS			PERFORMED			REMARKS
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3110	22-72	Kit and ente	r on ABC/TR the foll	owing;	monty		11.2581	
,		1 Ext 9129	22-1 16 11	13 ITEM 25			·	
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3115	51-11	Kit inspect.				17	1/35/0	
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3120	22-74	Carefully re	move the following, p	art U13, bag, tag	Philips.	. U	11.2781	
		and forward	to Q.A.	•		7		
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Sh	al C		ASSEMBLY HISTORY REC	BLY HISTORY RECORD CONTINUATION SHEET				
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SBRC REQUEST FOR SHIPMENT 5245

THIS REQUEST MUST BE FILLED OUT COMPLETELY IN ACCORDANCE WITH THE INSTRUCTIONS ON THE REVERSE SIDE HEREOF SHIPPING CANNOT PROCESS INCOMPLETE REQUESTS

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FAILURE ANALYSIS REPORT

FAR No. 9274 Program Thematic Mag Page 1 of 7

DATE OF RECEIPT	1-11-82	TSD PROJE	ECT ENGINEER W. Ge	ttys
REQUESTER	H. Persh/F. Carle			(
ORG . 44-07 P	HONE 6488388 BLDG./MS 541	/B355 PHON	6458194	
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	FET Switch	DATE OF	FAILURE 11-20-81	·
GENERIC P/N	DG185AL		ELEVEL Card	
HUGHES P/N	912922	LOT NUN	9C249-50	26
	fx PIN SD853		SYMBOL U13	
	7913 _{S/N} G3347	MODULE	52250-2	201 S/N
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X APPENDED	FAILL'RE ANALYST	JCURNAL	APPROVAL	DATE

Reported Failure:

High "off" state leakage of 5uA @ $20^{\circ}C$, increasing to 10uA @ $50^{\circ}C$ on pins 1 and 2 only.

Background Information:

The above failure was observed while testing per procedure 16520 para. 4.3. The subject device, which was U13 on the SLC PHB, assembly 52250-2 5/N 201, was replaced. No additional testing of the device was performed prior to its submittal for failure analysis.

Outline of Anlaysis:

- 1. External Visual Examination
- 2. Electrical Tests
- 3. Hermeticity Testing
- 4. Particle Impact Hoise Detection (PIND) Testing
- 5. Internal Examination
- 6. Electrical Probing

Results of Analysis:

- 1. External Visual Examination.
 - a) Markings: G5347 (on attached label) SDG8531 (Siliconix logo) 7913
 - b) Case Examination:

The leads were crimped, slightly bent and solder coated. There was adhesive tape on the bottom surface. No other obvious visual physical anomalies were noted.

- 2. Electrical Testing.
 - a) Curve Tracer Measurements:

Current-voltage characteristics were obtained for each pin to V+ (pin 6) and to V- (pin 9), in both polarities. Pins 1 and 2 were degraded to both V+ and V- as compared to other JFET output pins. No other obvious defects were indicated. See Figures 1 and 2 for pin connection and schematic diagrams.

b) Functional and Parametric Tests:

The device was functionally tested with V+ = 15V, V- = -15V, VL = 5V, VR = 0V, VIL = 0.8V and VIH = 2.0V. With no current flow across the JFET, source and drain voltages were measured. All outputs remained at 0V regardless of the input state except pins 1 and 2 (S4 and D4), which floated at -14.72V to -14.77V for input states 0 and 1, respectively.

The device was tested per 912922 for rDS(on), IS(off), IIN, I+, I-, IL and IR. All data were within the specified limits except IS(off) of pin I (gate 4), which was $33.4\mu\Lambda$ but should be I.OnA maximum. The data are summarized as follows:

(continued)

Results of Analysis: (continued)

2. Electrical Testing. (continued)

b) Functional and Parametric Tests: (continued)

PARAMETER TDS(on) IS(off)1 ID(off)1	GATE 1	GATE 2	<u>GATE 3</u>	GATE 4	LIMIT
	34.5Ω	34.0Ω	30.9Ω	30.6Ω	75Ω max.
	0.109nA	0.133nA	0.079nA	*33.4μA	1.0nA ma
	0.051nA	0.070nA	0.035nA	0.030nA	1.0nA ma
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^{*} Out of tolerance.

c) Baking and Additional Testing.

The device was baked for 2 hours at $+150^{\circ}$ C and retested for Is(off)1-Is(off)1 of gate 4 was 38.1uA compared to 33.4uA before baking. The other gates did not change significantly in Is(off)1.

3. Hermeticity Testing.

The device passed the fine leak test and the gross leak characterization.

4. Particle Impact Noise Detection (PIND) Testing.

No indications of loose internal particles were noted during PIND testing.

5. Internal Examination.

Internal examination revealed a crack in the die containing the driver circuitry. The crack extended across the source and channel regions of MOSFET Q5 and terminated at the scribe surface. The crack also passed under the metallization leading from the source of Q5 to the output JFET, Q6. The above mentioned defects pertain only to gate 4. (See Figures 3 through 5.)

6. Electrical Probing.

The JFET between pins 1 and 2 was isolated from the driver chip by lifting the source and gate leads. The JFET was then tested for source-gate and drain-gate characteristics and was not found to be degraded.

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Conclusions:

The reported failure, high "off" state leakage, was confirmed. Excessive leakage current (IS(off)) was observed through pins 1 and 2 at ambient temperature. Pins 1 and 2 were also observed to float near V- while the other switch outputs were at ground. No other electrical defects were indicated. Baking did not elicit significant change in IS(off) of pins 1 and 2. Internal examination revealed a crack across the die containing the driving circuitry. This crack passed through the MOSFET leading to the source and gate of the JFET switch across pins 1 and 2. It is believed that the high leakage was due to the crack since the JFET switch was not found to be defective. This failure is judged to have been primary.

Pin Number	Designation
1	SL
2	DĦ
3	DS
i,	S2
5	IN S
6	v*
7	٧L
8	v _R
9	v -
10	IN 1
11	S <u>1</u>
12	DI
13	D3
14	53

FAR. NO. 9274
PAGE 5 OF 7

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Figure No. 1

Pin connection table for the 912922.

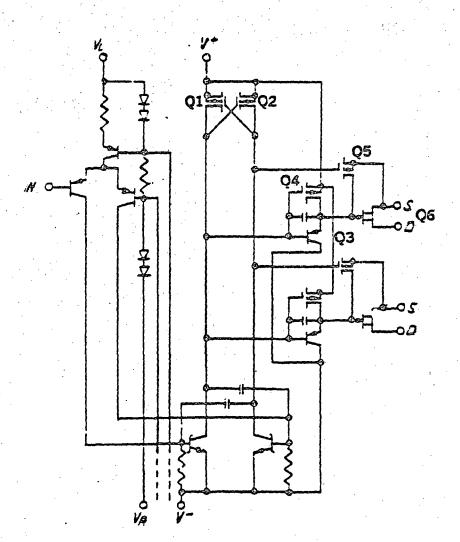
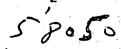


Figure No. 2

Schematic diagram for a typical inpochannel with two DPST JFET switches





ENGINEERING TECHNICAL COMMENTARY

According to FAR 9274

COMMENTARY

The device was tested and found to have failed the reported failed parameter, IS(off). The spec limit was 1.0nA max, and the device measured 33.4 A. This high leakage was probably due to the crack discovered in the die during the internal visual examination. The crack was probably caused by poor handling techniques during assembly.

RECOMMENDATIONS:

Device is considered a random failure. If other devices from this lot are available, a few devices should be temperature cycled to determine if other devices may have this same sort of defect.

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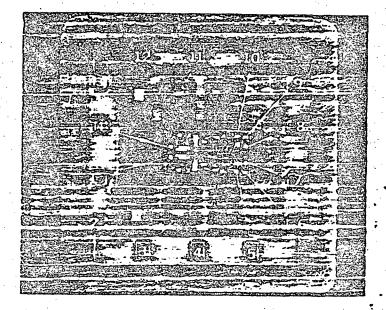


Figure Ila. 3

Photomicrograph of the cavity showing the driver circuitry. (center die) and the four JFET switches on separate substrates.

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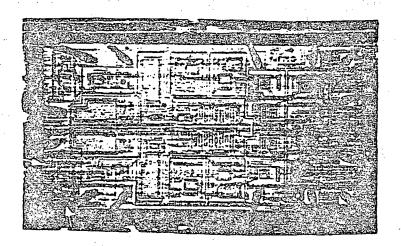


Figure No. 4

Overall view of the center die showing the location of the crack shown in Figure 5 (between arrows).

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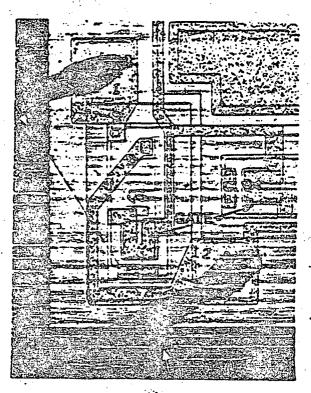
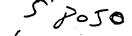


Figure No. 5. Detailed view of the crack across MOSFET Q5 of the driver circuitry. Note that the crack extends to the scribe surface at the edge of the die (between arrows). (182X)

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SANTA BARBARA RESEARCH CENTER A Subsidiary of Hughes Aircraft Company

CC: See Distribution List



INTERNAL MEMORANDUM

DATE:15 March 1982

REF: 9S 236-7891 PE 55:82

FROM: L. O'Connell

BLDG. B-11 EXT. 6357

MAIL STA. 39

SUBJECT: Failure of P/N 912922

Parts Board

TO: Frank Carle

On 20 November 1981 a failure was observed in the TM Scan Line Corrector. This failure was repaired by the replacement of P/N 912922.

- 2. TSD FAR 9274 declares that the failure may be due to possible mishandling during the manufacturing process.
- 3. This unit was procured from Siliconix. Please take any necessary action to advise the manufacturer and to preclude the repetition of this type of failure.

L. O'Connell, Manager

Administration and Reliability. Thematic Mapper Program

LOC: jc

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SANTA BARBARA RESEARCH CENTER A Subsidiery of Hughes Aircreft Company

INTERNAL MEMORANDUM

TO: O.I. Nakano

SUBJECT: Failure Reports F2723,

F2724 and S8051

CC: D. Adams

L. Altman

DATE: 1 February 1982

REF: PE 15:82

FROM: L. O'Connell

51-41

BLDG. B-11 MAIL STA. 39

EXT. 6357

This is to confirm our Tel-Con of February 1,1982 regarding subject Failure Reports.

As I stated to you all three Failure Reports were written against the same printed wiring board (P/N 50916, S/N 201). The cause of the test failures in each case was the installation of an incorrect resistor.

Contract quantities of subject boards have been completed. However, to help you preclude reoccurrence of this type of discrepancy on future orders or current production, copies of subject Failure Reports are attached so you can discuss the problem with Responsible Manufacturing Supervision.

L: O'Connell, Manager Administration and Reliability

Thematic Mapper Program

LO:jc

HUGHES

SPACE AND COMMUNICATIONS GROUP

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HUGHES

SPACE AND COMMUNICATIONS GROUP

HUGHES AIRCRAFT COMPANY SPACE AND COMMUNICATIONS GROUP

FAILURE REPORT CONTINUATION SHEET

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SPACE AND COMMUNICATIONS GROUP

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3	B FAILURE TRIMARY	UNKNOWN NO FAILURE		33. FAILURE	CRITICAL MANGE	HINOR SAFETY			
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HUGHES

SPACE AND COMMUNICATIONS GROUP

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6. MARDWARE LEVEL WHEN FAILURE WAS OGSERVED	SPACECRAFT SYSTEM	SUBSYSTEM UNIT		SSEMBLY	MODULE		C CARD	2
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AND								38. QA RETEST	
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	12. DOCUMENT MPLEM CORRECTIVE ACTIO		04366	5 H G	FECTIVITY S	1 3 5 Suas	1/1/	7141	
	34 SASIC CAUSE	C DESIGN CONTROL	TEST EQUIPMENTES	RE 🗀 AS	G. PROCEDURE SY/FAB ERROR	WIRING: ERROR ROUGH: HANDLING WEAR-TELT	D WIKNOWN	DEFECT CODE	
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ENGINEERIN	OF VERIFIED FAILURE 35. FAILURE TYPE	DEFECTIVE PARTS PRIMARY INDUCED	☐ UNKNOWN Syno failure		38. FAILURE CLASSIFICATION	C CRITICIAL C MALOR MENGINGER	UNINOR SAFETY	5/21/00	

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Hughes Aircraft Company Space and Communications Group El Scounds, California FAILURE REPORT

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	O. HAROWARE LEVE WHEN FAILURE	SPACECRAFT	☐ SUBSYSTEM	Ž.		O MODULE	CARO	
	WAS OBSERVED	SYSTEM	UNIT	ច s	UBASSEMBLY (I RECAM	PART	
	7. SUBSYSTEM	CATION:	BAAAN		PART NUMBER	S/M	UMAN	FACTURER
	8. UNIT	·	~ ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~					
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Œ	ASSEMBLY	SUBASSEMBLY	BAND 2 POS	TAMP	50904-	2 201	SBRC	?
RIGINATO		MICAM CARD					·	
종	11. OTHER					· ·		
O.	12. TEST WHEN FAILURE WAS OBSERVED	口 DEVELOPMENT 江N-PROCESS	O QUALIFICATIO			LAURCH OPERATIONS		
	13. ENVIRONMENT WHEN FAILURE COVERSESO ZAW	AMBIENT CENC/RR	MOTABLE D	Z TE		TRERMAL VAC	HRS AT C OTHER	
	14. DESCRIPTION OF FAILURE	CHANNEL	13 FA	WED :	TO MEST	PRE-GA	UN RESI	STOR (RE
	SELEC	TION A	QUIREME	NTS	MITHOUT	USING	AN OUT	-OF-
	RANGE	COMPON	IENT. L	MAITS:	4.121	TO 11.8		E: 3.83K
	15. TEST PROCEDURE		PARA	16 OF	C DA VISO	CAG	明初	17. CONTINUATION SHEET USED
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	TO PR	OXIDE A	DJUSTMEN	17.	E. O. TO	SPEC	REQUIR	Eda
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SPACE AND COMMUNICATIONS GROUP FAILURE REPORT

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Γ	1. PHOGRAM NAME /	TIC MAPP	HS 2362 GL		1 WOODEL FLT	4. TIME OSSERVED	MO JO DA	28 YR 8/
	6. MARDWARE LEVEL WHEN FAILURE WAS OBSERVED	SPACECRAFT SYSTEM	SUBSYSTEM		SSEMBLY UBASSEMBLY	MICAM	CARD . D PART	
	EQUIPMENT IDENTIFIC	ATION:	NÁME		PART HUMBS	R S/N	MANU	FACTURER "
ŀ	7 SUBSYSTEM		 		 			· · · · · · · · · · · · · · · · · · ·
	& UNAT	· · · · · · · · · · · · · · · · · · ·					<u> </u>	·
œ.	8. MASSMALY	SUBASSEMBLY (MERIM CATION A	EGISTER V	NIT 5094	18 201		
E	10. []. MODULE [] 1	IICAM [] CARD						
2	11 OTHER							
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	13. ENVIRONMENT WHEN FAILURE WAS OBSERVED	O EMC/RR	AAGIATION	☐ TE		THERMAL VAC	HRS AT	
1	14. DESCRIPTION OF FAILURE	<u> </u>	GIOGE BETT					1N 8
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	18. TEST PROCEDURE	122	PARA	18. OA	J. GUYTON	22-13	10-28-4/	17. CONTINUATION SHEET USED
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g	20. A FOLLOWING RE	WORK/RETEST REQUIR ST NOT REQUIRED GECA	WSB REMOVI	ج دول	ER BRIDG	E BETWEE	V U3L PIN	7 AND
ENGINEERING	431 PIN				422 PARA			
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2	20. UST ALL PARTS A					<u> </u>	 	8.8
2	PART NUMBER	CKT SYM	PART LOT NUMBER	DATE CODE	MANUFACTURER	PROBAGUE	DEPECT	ANALYSIS NUMBER
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A.	ZT. REWORK BY	<u> </u>	ORG DATE		ETESTED BY GUYTON	08G	10-30-81	29. CONTINUATION
Г	30. CAUSE AND CORRECTIVE ACTIV		NORKM ANSHI		_	SPLA SH.		
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	CLOS	ER SUBSEDI	ENT VISUAL	INSPEC	TIONS CAN	OBSERVE	31 FAB CLOSURE	
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ABIL		BOYINTON TH			TIMS SIPHLE	BOWNT		\mathcal{J}'
ELI	<i></i>			dun			1 / Bum	~101
9/6				3-8/		SHEET USED	1/1///1	31/1
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ENGINEERING/RELIABILITY	M. BASIC CAUSE OF VERIFIED FAILURE	DESIGN ENVIRONMENTAL DEFECTIVE PARTS	TEST EQUIPMENT TEST PROCEDU	RE 🖫 AS	G. PROCEDURE (SY/FAB ERROR DREMANSHIP	WIRING ERROR ROUGH HANDLING WEAR-OUT	C UNKNOWN	DEFECT CODE
E	35. SAILURE	PRIMARY	UNKNOWN O NO FAILURE		38. FAILURE	CRITICAL	MINOR SAFETY	
	37 RESPONSIBLE ENG	NOUCED	ORG DA	-30-81	CLASSFICATION 33. SPACECEP T	EM ENGINEER	27-61	8/11/12
	3 · Elever Lity	iman.	OBG DA	-30-KJ	EL CATOMETON SU	FER .	· · · · · · · · · · · · · · · · · · ·	DATE
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_	EL SEGUNDO, CALIFORNIA	FAILURE	(430	
	1. PROGRAM NAME AND NUMBER THEMATIC MAPPER	S 236 2 GL		OBSERVED S. DATE OBSERV	4 28 YR 8/
	6. HARDWARE LEVEL SPACECRAFT WHEN FAILURE SYSTEM	C SUBSYSTEM 00 /	ASSEMBLY D MODE	ILE CARD	
1	EQUIPMENT IDENTIFICATION:	NAME	PART NUMBER		UFACTURER
ı	7. SUBSYSTEM		1	-	
	& UNIT ELECTRONIC MO	110	ļ <u>.</u>		
l	8. WASSEMBLY D SUBASSEMBLY CA	LAMP/INCHWORM		+ 3 4 1 4 5	
e G	10	DRIVER DRIVER	50926	20 513	<u> </u>
NAT	II. OTHER	NOVE			
ORIGINATOR	12. TEST WHEN FAILURE WAS COSERVED OSERVED OSERVED		ITEGRATION LAUNS	H OPERATIONS	
	13. ENVIRONMENT OF AMOUNT	☐ RADIATION ☐ TI	EMPPME		
	WAS OBSERVED DEMC/RFF	PARA 3.3. Z.Z	FORMIN TYPE	TPUT	
	Urraune 10 000	IARA 3,3, 22	- 144 -124 00	(60)	
	18. TEST PROCEDURE 234	13.3.2 10 OF	FGINATOR COLLEGE	ORG CATE	17. CONTINUATION
종	18. VERIFICATION AND FAILURE ANALYSIS AR 6 OPER	ATIONAL AMPLIFIER	MISTALLED UPSID	E DOWN (CLOCKED)	BACKWARD)
ATE	AR 6 OVERTRESS	D- Na STHE	ER PARTS OF	leasters of	29-82
EVALUATION	+/2/AND -/2/	PROSE 10 B	19. FAILED ITEM NAME	INTELCHANGE	ed - /HIS
	20. S FOLLOWING REWORK/RETEST REQUIRED	OPAMP TO	AND PART NUMBER AR	6	
2	20. 2 FOLLOWING REWORK/RETEST REQUIRED DECAUSE DECAUSE	REMOVE AND RE	PLACE ARE		1
ENGINEERING	RETEST PER PARA	3.3.2.2			
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UFACTURING	PART NUMBER CKT SYM P	ART LOT NUMBER DATE CODE	MARUFACTURER	PROBABLE DEFECT	ANALYSIS MUMBER
IANUFACTURING	PART NUMBER CXT SYM P. AR. 6				
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FAILURE REPORT

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CONTINUATION SHEET LETTE	T.

SPACE !	AND COMMUNICATIONS GROUP CONTINUATION SHEET	CONTINUATION SHEET LETTER
	"Label first continuation sheet used 'a', second 'b', and so on	ADDITIONAL FR CONTINUATION
	Dentify entries by referencing fr block number in column, date each entry.	SHEET(S) USED
18	FAIL HOWEVER NO OUT OF SPEC SIGNAL TO ANY FOLLOW-ON CIRCUITEY AS THE -	WAS SENT
		= LM 108
		THE MAY
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SPACE AND COMMUNICATIONS GROUP FAILURE REPORT

S 8311

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	THE PROGRAM NAME AND NUMBER #5276	GLA	3. MODEL	4. TIME OBSERVED	MO O DA	1
	6. MAROWARE LEVEL SPACECRAFT SUBSYS	TEM WET		1 HODULE	CARD	27 07
1	WAS OBSERVED SYSTEM JUNIT			MICAM	PART	• *
	EQUIPMENT IDENTIFICATION: NAI	ue .	PART NUMBE	A S/N	MANU	ACTURER
	7. SUBSYSTEM					
1	8. UNIT					
1_	9. DEASSEMBLY D SUBASSEMBLY SER ENAS OSA	ea los	50900	200	 	
[2	10. MODULE MICAM CARD	8 Bed 856	30708	202		
ORIGINATOR	11. OTHER					
9	12. TEST WHEN I DOUBLEST DOUBLES				<u> </u>	
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	13. ENVIRONMENT AMBIENT RADIATH	ON BYE	4.950 ·C	THERMAL VAC	HRS AT	_•
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	15. TEST PROCEDURE	SARA IS. OF	GINATOR	2243	PA / 100 / 100	17. CONTINUATION
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20	FAILURE ANALYSIS SHIFT KEGISTER	<u>****</u>	909940-1		DUTPUT AT	HI TEMP
A	(50°L) APPEARS TO SHIFT INCORPECT	LY AS DOCUM	ENTED IN A	TACHED TES	T DATA R	ELORD

EVALUATION			19. FAILED ITEM NAME AND PART NUMBER	SHIFT REGISTE	R (417) 909	940-1
	20. OF FOLLOWING REWORK/RETEST REQUIRED	Vr 4:0 C:				
ENGINEERING	B REWORK/RETEST NOT REQUIRED SECAUSE REMO		PLACE UIT	(909940-1)	S=- =	
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ē	COPY ATTACHED)			7000		
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AND						110
2	FOR > ONE HOUR AS SPECIFIE 28. UST ALL PARTS REPLACED	D DN 5 NOV	AND 6 NO	1 1481 PASSED	WITHOUT FAILURE	
巪	PART NUMBER CKT SYM PART LOT NUM	BER DATE CODE	MANUFACTURER	PROBABLE	DEFECT	ANALYSIS NUMBER
RUFACTURING	909940-1 117					
F			<u>-1</u> (1)			
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	CORRECTIVE ACTION REFER TO	# 2 236.	7794 (2	P7 1777A	KHED J	
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2	34 BASIC CAUSE DESIGN TEST EQU	OCEDURE 🔲 AS	G. PROCEDUŘE SY/FAB ERROR	WIRING ERROR	S UNKNOWN	DEFECT CODE
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SANTA BARBARA RESEARCH CENTER A Subcidiory of Hughes Aircreft Company

INTERNAL MEMORANDUM

Distribution

œ:

DATE: November 9, 1981

REF: HS 236-7714

SUBJECT:

22-13 Supplemental Information for

Failure Report S8311

FROM: J. A. Banach

BLDG. B12 MAIL STA. 58

6203

Description of the Function of the Serial Magnitude Board (P/N 50900).

The function of subject board is to receive sarial data and process it as Discrete Digital TTL Commands; in addition, the card echoes back as talemetry serial input commands.

Description of Problem.

At high temperature (+50°c) following approximately one (1) hour of operation (> 1,000,000 cycles) the primary side experienced failures on two (2) separate occassions (consecutive days). Fullowing replacement of Ul7 the same failure occurred once.

Failure Description

The echo telemetry did not meet specification, although the output commands were always correct. NOTE: Is condition - data sent was 5555. Command data outputted from board was 5555. Confirmed telemetry data received was AB55. Should be condition - Telemetry data received should be 5555. (refer to attached data sheet.)

Rational For Not Replacing Additional Components or Taking Additional Corrective Action.

Subsequently on two following days (including in excess of four (4) hours of additional high temperature testing) the failure mode could not be duplicated. (Engineering estimate of test cycles is > 10,000,000 cycles).

Engineering judgement concludes that further removal and replacement of components in a selected fashior would still be speculative and not worth the risk to board damage.

The board's telemetry is read in real time, such that this failure observation is unlikely to occur. (NOTE: Output commands are always observed to be correct in our testing of subject board.)

Additional corrective actions are not planned at this time.

Head, Circuit Design, System Integration

Thematic Mapper Program

Concurrence

L. O'Connell Reliability Manager

Thematic Mapper Program

MONITOR

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58311

T12

TEST PROGRAM NO. 18 - - - - > SERIAL MAGNITUDE CMD AUTO DATA TEST SENDS ALTERNATING BIT PATTERN TO IMC ROD. READS TELEMETRY & ACTUAL DUTPUT FOR VERF2

ENTER OPERATOR DATA: YES OR NO ! Y

ASSY. NO.: ---- 50900

CARD NAME: ---- SERIAL MAG CMD RECYDEC

SERIAL NO.: ---- 202

DATE & TIME: --- 29 DCT '81

PRI. OR RDT.: --- PRI

TEST OPERATOR: -- J GUYTON

OTHER TEST

CONDITIONS: ---- OPERATIONAL TEMPERATURE SO DEGREES C.

TO START TEST EXECUTION PRESS "G" KEY.

(TO TERMINATE TEST PRESS "ESC" KEY.)

RUN WITH CONSTANT DELAY, YES OR NO ! YESS PRINT VERIFICATION ERRORS: YES OR NO ! YES

50 DEGREES C REACHED AT 10:15

Sein 8311

10:0 101110:01011 DATA SENT WAS 5555 TELEMETRY IS ABS5 ACTUAL DUTPUT IS 5555 DATA SENT WAS 5555 TELEMETRY IS AB55 ACTUAL DUTPUT IS 5555 DATA SENT WAS 5555 TELEMETRY IS ABS5 ACTUAL DUTPUT IS 5555 DATA SENT WAS 5555 TELEMETRY IS AB55 ACTUAL OUTPUT IS 5555 DATA SENT WAS 5555 TELEMETRY IS AB55 ACTUAL DUTPUT IS 5555

CURRENT CYCLE COUNT IS : 0002079500

CURPENT ERPOR COUNT 15: 0000000005

- - TESTING COMPLETED - -

DATE & TIME: ---- 29 DCT 181

PRI. OF RDT.: --- PRI

TEST OPERATOR: -- J GUYTON

OTHER TEST

CONDITIONS: ---- PRIMARY SIDE DATA CYCLING AT 50 DEGREED C

TERMINATED AT 11:15

MONITOR

29 007 11

NUMBER

11323

16389

SHEET

SIZE

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TEST PROGRAM NO. 12 - - - > SERIAL MAGNITUDE CMD AUTO DATA TEST SENDS ALTERNATING BIT PATTERN TO SMC R/D, AN
READS TELEMETRY & ACTUAL OUTPUT FOR VERF.

ENTER OPERATOR DATA: YES OR NO ! Y

ASSY. NO.: ---- 50900

CARD NAME: ----- SER MAG CMD RECYDEC (A10)

SERIAL NO.: ---- 202

DATE & TIME: --- 5 NOV 181

PRI. OR RDT.: --- PRI

TEST OPERATOR: -- J GUYTON

DTHER TEST

CONDITIONS: ---- OPERATIONAL TEMP 50 DEGREES C AT 10:44

(PRI)

TO START TEST EXECUTION

PRESS "6" KEY.

(TO TERMINATE TEST PRESS "ESC" KEY.)

RUN WITH CONSTANT DELAY, YES OR NO ! Y ... PRINT VERIFICATION ERRORS, YES OR NO ! Y

CURPENT CYCLE COUNT IS: 0001858252

CURRENT ERROR COUNT IS: 0000000000

- - TESTING COMPLETED - -

DATE & TIME: --- 5 NOV '81 . 11:44

PRI. OF RDT.: --- PRI

TECT OPERATOR: -- I BUYTON JOYED & NOV Y

OTHER TEST

CONDITIONS: ---- TERMINATE DATA CYCLING AT 50 DEGREES C (PRI)

Retest FIR 9311

MONITOP

T12 > SERIAL MAGNITUDE CMD AUTO DATA TEST -TEST PROGRAM NO. 12 SENDS ALTERNATING BIT PATTERN TO SMC RVD. AN READS TELEMETRY & ACTUAL DUTPUT FOR VERF.

ENTER OPERATOR DATA: YES OR NO ! YES

ASSY. NO.: ----- 50900

CARD NAME: ---- SER MAG CMD REC / DEC

SERIAL NO .: ---- 202

DATE 5: TIME: ---- 5 NOV '81 11:55

PRI. OR RDT.: --- RDT TEST OPERATOR: -- J GUYTON

OTHER TEST

CONDITIONS: ---- OPERATIONAL TEMP (50 DEGREES C) REACHED AT 11:55

TO START TEST EXECUTION PRESS "6" KEY.

(TO TERMINATE TEST PRESS "ESC" KEY.)

RUN WITH CONSTANT DELAY, YES OR HO ! Y PRINT VERIFICATION ERRORS: YES OR NO ! Y

CURRENT CYCLE COUNT IS: 0001910341

CURRENT ERROR COUNT IS: 0000000000

- - TESTING COMPLETED - -

DATE & TIME: ---- 5 NOV '81 12:56

PRI. OF EDT.: --- EDT

TEST OPERATOR: -- J GUYTON J GUYTON 5 HOV'YI

DITHER TEST

CONDITIONS: ---- TERMINATE REDUNDANT DATA CYCLING AT 50 DESPESS C. AT 12:56.

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MONITOR

TIE TEST PROGRAM NO. 12 - - - - > SERIAL MAGNITUDE CMD AUTO DATA TEST -SENDS ALTERNATING BIT PATTERN TO SMC R/D. AND READS TELEMETRY & ACTUAL OUTPUT FOR VERF.

ENTER OFERATOR DATA, YES OR NO ! Y

ASSY. NO.: ---- 50900 CARD NAME: ---- SER MAG CMD REC/DEC (A10) SERIAL NO.: ---- 202 DATE & TIME: ----PRI. OR RDT.: --- RDT 5 NOV 181 13:07 TEST OPERATOR: -- J GUYTON OTHER TEST CONDITIONS: ---- OPERATIONAL TEMPERATURE O DEGREES C.

TO START TEST EXECUTION PRESS "6" KEY.

(TO TERMINATE TEST PRESS "ESC" KEY.)

RUN WITH CONSTANT DELAY, YES OR NO ! Y PRINT VERIFICATION EPROPS, YES OF NO ! Y

O DEGREES C. REACHED AT 13:14.

CURPENT CYCLE COUNT IS: 0002075128

CURPENT ERROR COUNT IS: 000000000

- - TESTING COMPLETED - -

DATE SITIME: ---- 5 MOV 181

PRI. OF PDT.: --- PDT

TEST OFERATOR: -- I GUYTON & GOYEN FUNIVI

OTHER TEST

COMDITIONS: ---- RDT SIDE DATA CYCLING AT 0 DEGREES C TEPMINATED AT 14:14

MONTADE

T12 TEST PROGRAM NO. 12 - - -- - > SERIAL MAGNITUDE CMD AUTO DATA TEST -SENDS ALTERNATING BIT PATTERN TO SMC P/D. AND READS TELEMETRY & ACTUAL OUTPUT FOR WERF. ENTER OPERATOR DATA: YES OR NO ! Y ASSY. NO.: ---- 50900 CARD NAME: ---- SER MAG CMD RECYDEC SERIAL NO.: ---- 202 DATE & TIME: ---- 5 NOV 181 PRI. OF PDT.: --- PRI TEST OPERATOR: -- J GUYTON OTHER TEST CONDITIONS: ---- PRI SIDE DATA CYCLING AT 0 DEGREES C BUGUN AT 14:21 TO START TEST EXECUTION PRESS "6" KEY. (TO TERMINATE TEST PRESS "ESC" KEY.) RUN WITH CONSTANT DELAY, YES OF NO ! Y PRINT VERIFICATION ERRORS. YES OR NO ! Y CURRENT CYCLE COUNT IS: 0001839075 CURPENT ERPOR COUNT IS: 0000000000 - - TESTING COMPLETED - -DATE & TIME: --- 5 NOW 181 15:21 PPI. OF PDT.: --- PRI TEST OPERATOR: -- U GUYTON degras 5 mily OTHER TELT ---- PRIMARY SIDE O DEGREED DATA CYCLING COMPLITIONS: TERMINATED AT 15:21.

MONITOP

Retail Colo

MONITOR

T12
TEST PROGRAM NO. 12 - - - > SERIAL MAGNITUDE CMD AUTO DATA TEST SENDS ALTERNATING BIT PATTERN TO SMC R/D. /
READS TELEMETRY & ACTUAL OUTPUT FOR VEPF.

ENTER OFERATOR DATA: YES OR NO ! YES

ASSY. NO.: ---- 50900

CARD NAME: ---- SER MAG CMD REC/DEC (A10)

SERIAL NO.: ---- 202

DATE & TIME: ---- 5 NOV '81 16:22

PRI. DR RDT.: --- PRI

TEST OPERATOR: -- J GUYTON

DITHER TEST

CONDITIONS: ---- PRI SIDE COLD START UP AT -25 DEGREESC.

TO STAPT TEST EXECUTION PRESS "6" KEY.

KTO TERMINATE TEST PRESS "ESC" KEY.)

RUN WITH CONSTANT DELAY. YES OF NO ! Y PRINT VERIFICATION ERRORS, YES OF NO ! Y

CURRENT CYCLE COUNT IS: 0000045438

CURRENT EPROP COUNT IS: 0000000000

- - TESTING COMPLETED - -

DATE & TIME: --- 5 NOV 181 16:23

PRI. OR ROT.: --- PRI

TEST OPERATOR: -- J GUYTON & GUYES 5 MY 141

OTHER TEST

CONDITIONS: ---- TERMINATE PRI SIDE COLD START UP.

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TEST PROGRAM NO. 12 - - - > SERIAL MAGNITUDE CMD AUTO DATA TEST SENDS ALTERNATING BIT PATTERN TO SMC P/D, AM
READS TELEMETRY & ACTUAL OUTPUT FOR VERF.

ENTER OFERATOR DATA, YES OR NO ! Y

ASSY. NO.: ----- 50900
CAPD NAME: ----- SER MAG CMD REC/DEC (A10)
SERIAL NO.: ---- 202
DATE & TIME: ---- 5 NOV /81 17:23
PPI. OR PDT.: --- RDT
TEST OPERATOR: -- J GUYTON
OTHER TEST

CONDITIONS: ---- RDT SIDE COLD STARTUP AT -25 DEGPEES C.

TO START TEST EXECUTION PRESS "G" KEY.

(TO TERMINATE TEST PRESS "ESC" KEY.)

PUN WITH CONSTANT DELAY. YES OR NO : Y
PRINT VERIFICATION ERRORS, YES OR NO : Y

CURRENT CYCLE COUNT IS: 0000064979

CURRENT ERROR COUNT IS : 0000000000

- - TESTING COMPLETED - -

DATE & TIME: --- 5 NOV '81 17:25
PRI. OR RDT.: --- RDT
TEST OPERATOR: -- J GUYTON & GUYTON 5 por 'F')
OTHER TEST
CONDITIONS: ---- TERMINATE RDT SIDE COLD STARTUP.

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TEST PROGRAM NO. 12 -> SERIAL MAGNITUDE CMD AUTO DATA TEST -SENDS ALTERNATING BIT PATTERN TO SMC R/D. A READS TELEMETRY & ACTUAL OUTPUT FOR VERF.

ENTER OPERATOR DATA. YES OR NO ! Y

ASSY. NO.: ---- 50900

CARD NAME: ----- DER MAG CMD RECYDEC (A10)

SERIAL NO.: ---- 202

09:30 6 AN 181 HEUTED DATE & TIME: ---- 5 NOW '81

PRI. OR RDT.: --- PRI

TEST OPERATOR: -- J GUYTON

OTHER TEST

--- OPERATIONAL TEMP 50 DEGREES C REACHED AT CONDITIONS: -

09:50

TO START TEST EXECUTION PRESS "G" KEY.

(TO TERMINATE TEST PRESS "ESC" KEY.)

RUN WITH CONSTANT DELAY, YES OR NO ! Y PRINT VERIFICATION ERRORS, YES OR NO ! Y

CURRENT CYCLE COUNT IS : 0002151151

CURRENT ERROR COUNT IS : 0000000000

- - TESTING COMPLETED - -

DATE & TIME: ---- 6 NOV '81 10:54

PRI. OR RDT.: --- PRI

TEST OPERATOR: -- J GUYTON

OTHER TEST

CONDITIONS: ---- TERMINATE PRI SIDE DATA CYCLING AT 50 DEHREES C.

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	SP	ECIAL TEST REQUEST	ORIGINAL PAGE IS OF POOR QUALITY
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INSTRUMENT/MOD	IELTM/FLT 50900/S	N 2021MAJOR TEST PHASE	ASSEMBLY ACCEPTANCE TES
APPLICABLE DOC		APPROX. TEST TIME	2 HRS
,		TIONAL PENALTY TESTING AT	•
		RE REPORT \$8311. PREVIOUS - 7714 WAS UNACCEPTABLE	
•		EMBLY TEST CONFIGURATION	• •
	E 16389 PARA	•	
•			
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1001 30000	SSPUCCY CMPCC	TED DATA ATTACE	rev:
V. p. /			
		*	
2 11 .	Q BAD		
Product Effectives		PATE 11/2/51	
TEST DIRECTOR_	ON /	DATE: "/17/8/	7/
SYST. EMSIN	Je Harry	DATE:	
	(USE CONT	INUATION SHEETS IF REQU	IRED)

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MONITOR 3 T12-1 TEST PROGRAM NO. 12 - - - - > SERIAL MAGNITUDE CMD AUTO DATA TEST -SENDS ALTERNATING BIT PATTERN TO SMC R/D, AND READS TELEMETRY & ACTUAL DUTPUT FOR VERF. ENTER OPERATOR DATA, YES OR NO ! Y ASSY, NO.: ---- 50900 CARD NAME: ---- SER MAG CMD REC/DEC (A10) SERTAL NO.: ---- 202 DATE & TIME: --- 17 NOV 181 FRI. OR RDT.: --- PRI TEST OPERATOR: -- J GUYTON OTHER TEST CONDITIONS: ---- SPECIAL TEST REQUEST F-001, PRI SIDE DATA CYCLING AT 55 DEGREES C. (16389 PAR.5.4.1.2) RETEST. TO START TEST EXECUTION PRESS "6" KEY. (TO TERMINATE TEST PRESS "ESC" KEY.) RUN WITH CONSTANT DELAY, YES OR NO ! Y PRINT VERIFICATION ERRORS, YES OR NO ! Y 55 DEGREES C REACHED AT 16:10 CURRENT CYCLE COUNT IS : 0002021729 CURRENT ERROR COUNT IS : 00000000000 - - TESTING COMPLETED - -17:10 DATE & TIME: --- 17 NOV 181 PRI. OR RDT.: --- PRI TEST OPERATOR: -- U GUYTON OTHER TEST COMBITIONS: ---- TERMINATE SPECIAL TEST F-001, PRI SIDE DATA CYCLING AT

55 DEGREES C.

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SPACE AND COMMUNICATIONS GROUP FAILLIRE REPORT

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	L HARDWARE LEVEL WHEN FAILURE WAS OBSERVED	SPACECRAFT SYSTEM	SUBSYSTEM		SSEMBLY JBASSEMBLY	I MOOULE	CARD PART	
1	QUIPMENT IDENTIFICA	<u></u>	NAME		PART NUM			ACTURER
	. SUBSYSTEM							
T	S. UNIT	·					 	······································
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		MORK/RETEST REQUIRE						
-	A .	T NOT RECUIRED BECA			AT RIDE			
-	<u> Kenam</u>	- 2 2	Defizit (M	1966	AT_AISS	<u>, </u>		
2	RETES	r is l	(21. AL)	THORESATION		1086	T CATE	ZI. CONTINUATION
1	n newholipsteet	 		Carpen	<u>, </u>	42-13	1737/27	ZI. CONTINUATION SHEET USES A CONSESSIONS
عا	ACTION TAKEN	BRIDGE	AT RIOS	REMOV	<u>ED</u>			
	RETESTE	D PER	TEST PROU	EDURE 1	6422 PA	RR 5.		1210
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-								(110)
2	LUST ALL PARTS RE	CXT SYM	PART LOT NUMBER	DATE CODE	MANUFACTURER	PROBABL	E DEFECT	ANALYSIS NUMBER
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Γ				•				
Z	AEWORK BY	<i>P</i> <	22-74 DATE	71980 28 A	T GWTON	DRG ZZ-13	FNOV 1981	ZR. CONTINUATION
3	CAUSE AND				PASROCAT		- CCOPI KM	DE 11/23
\vdash	CORRECTIVE ACTIO	N BAB	PRINTED WIRE	BOARD	PABR. ON	10N ONLID	777	
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H 3		1/1/10/2	4				11/16	101
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3	CORRECTIVE ACTIO	ENTING!	100000	770-	COUNTY	TRESETT)	7// 11	11 11 1
34	BASIC CAUSE	DESIGN DESIGN ENVIRONMENTAL	TEST EQUIPMEN TEST PROCEDU TEST SET-UP	RE XX AS	G. PROCEDÚRE SY/FAB ERROR	WIRING ERROR	UNKNOWN	DEFECT CODE
F	FAILURE	C DEFECTIVE PARTS		C wo	RKMANSHIP	WEAR-OUT	☐ MINOR	
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SPACE AND COMMUNICATIONS GROUP

HUGHES AIRCRAFT COMPANY
SPACE AND COMMUNICATIONS GROUP
EL SEGUNDO CALIFORNIA

FAILURE REPORT CONTINUATION SHEET

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SPACE AND COMMUNICATIONS GROUP FAILURE REPORT

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SPACE AND COMMUNICATIONS GROUP FAILURE REPORT

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Hughes

SPACE AND COMMUNICATIONS GROUP

HUCHES AIRCRAPT COMPANY
PACE AND COMMUNICATIONS GROUP
EL EXCUNDO, CALIPORNIA

FAILURE REPORT

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	WAS DESERVED L.J. SYSTEM EQUIPMENT IDENTIFICATION:	NAME	PART NUMBER			ACTURER
	F SUBSYSTEM					
	& UNIT		<u> </u>			
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	13. ENVIRONMENT WHEN FAILURE WAS OSSERVED D ENCIRA		TEMP	THERMAL VAC	HRS AY	
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ag.	IS VERIFICATION AND FAILURE ANALYSIS					
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E						
EV			13. FAILED ITEM MAKE AND PART NUMBER	A6-2	909992-	Δ
9	20. ST FOLLOWING REWORK/RETEST REQUIRED C REWORK/RETEST NOT REQUIRED RECAUSE	REMOVE AND		•		
GINEERING	RELIACE AL-2					
20	RETEST PER TP		.3.5.4			
22		ZI. AUTHORIZATION	sel	CHG-13	11-9-81	CONTINUATION CHICA
	22. REWORK/RETEST ACTION TAGEN	. () 1.				24 (2)
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AND	SEE AHR SITY	5 SUPPLIES AP L	183,404 FOR	REWORK O	FAR-Z	S. OA PETEST
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2	L. TORRES 17	2-73 11/10/81	J. GUYTON	122-13	18/6/1	SHEET USED
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REE	KETLECEMENT CF	CHIP.		31. CONTINUATION	MIG	ا الا
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	19. (ELIABILITY	51-41 12-7-81	STORER OR SUP	ruy	A-39_1_	DATE
لــا	TO SC JAN 60	101-41 115 1-01	10/2/21			<u> </u>

Hughes

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SPACE AND COMMUNICATIONS GROUP FAILURE REPORT

8320

HUGHES AIRCRAFT COMPANY CS AND COMMUNICATIONS GROUP EL SEGUNDO, CALIPORNIA 1. PROGRAM NAME AND NUMBER 3:30p.a. 1. DATE OBSERVED T.M. FUGHT DA 24 YR 81 мо 9 VOIL HLROWARE LEVEL SPACECRAFT WHEN FAILURE SYSTEM SUBSYSTEM ASSEMBLY SUBASSEMBLY MODULE CARD PART EQUIPMENT IDENTIFICATION: PART NUMBER S/M MANUFACTURES 7. SUBSYSTEM 52347 ELECTRONIC. HODULE ASSEMBLY EL SUBASSEMOLY BAND 2 POST AMP SORC 50904-2 201 10. O MODULE O MICAM CARD 11 OTHER 12. TEST WHEN FAILURE WAS OBSERVED OEVELOPMENT U INTEGRATION ☐ QUALIFICATION LAUNCH OPERATIONS 11 ENVIRONMENT WHEN FAILURE WAS OBSERVED AMBIENT RADIATION Marous. - Ge | THERMAL VAC TA BOH AXIS FOR OTHER DESCRIPTION OF FAILURE DUTPUT 114) SHORT CHANNEL HYBRID (~8 ohms CIRCUITED 70 SIGNAL GROUND) PARAL S IS. TEST PROCEDURE 22/3 9-25-8/ II SMEET USED 16597 OF 04 SOLDER SIGNAL GROCIAI)) AND PART NUMBER US SPLASA REMOVED BEHAVIOR OBSERVED. 50859-4 20. C FOLLOWING REWORK/RETEST REQUIRED SECALSE PARTS FAILED NO 21. AUTHORIZATION DATE 22 CONTINUATION SOLOFFE SELASH REMOVED. PART FENCTIONS HS236-7794 Shows that my meets these AGALYSES_ occurred. M OA GETTS Tr. 28 LIST ALL PARTS REPLACED
PART NUMBER ANALYSIS NUMBER PART LOT NUMBER DATE CODS MANUFACTURER PROBABLE DEFECT CKT SYM NONE ZA RETESTED BY 27. REWORK BY DATE Carto DATE 29. CONTINUATION CORRECTIVE ACTION SOLDER SLASM INTRODUCED WHEEL MOVING SOLET RESISTORS NO OVERSTRUTS OCCURRED MANUFACTURING POESONAR BOPARO 31 FRE CLOSURE WHEN SOLDERAND CAMTRAD COMPONENTS, Inspection personnel andstrains there when inspecting saluts and review Bamily 31. CONTINUESTIO 32. DOCUMENT IMPLEMENTING CORRECTIVE ACTION Red'D NONE WIRING ERREDR BASIC CAUSE DESIGN ENVIRONM TAL TEST EQUIPMENT TEST PROCEDURE MFG. PROCEDURE ASSY/FAB ERROR Z UNKNOWN DEFECT CODE OF VERIFIED WEAR-OUT FAILURE TEST SET-UP VORKMANSHIP UNKNOWN 35. FAILURE TAL FAILURE CLASSIFICATION CALTICAL PLANSE PRIMARY ROMIN E SAFETY :NOSCED7 E SHAPECSAFT STEEM ENGIN 811104 122 DATE 51-11 11-02-81 011873 SC ...AN 80 4:131

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SPACE AND COMMUNICATIONS GROUP **FAILURE REPORT**

_	EL SZGUNDO, CA			· · · ·			<u> </u>		
	1. PROGRAM NAME A	V	011	2 6	.	FUGHT	3:15	MO 10 DA	., -
	6. HARDWARE LEVEL WHEN FAILURE WAS OSSERVED	SPAC	ECRAFT EM	SUBSYSTE		SSENGLY UBASSELSLY	☐ MODULE ☐ MECAM	CARO PART	··········
	EQUIPMENT IDENTIFICA	<u> </u>		NAME	<u> </u>	PART NUMBE			ACTURER
	7. SUBBYSTEM	· ·						 	
	& UseY ·			· · · · · · · · · · · · · · · · · · ·		ļ		<u> </u>	<u> </u>
	S. ASSENCELY	C SUBA	SEEWELY B	AND 4 A	ST And	50904	4 201	SA	ec.
ATO	10. C MODULE C N	10CAM []			DARD.		<u> </u>		\
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8	12. TEST WHEN FAILURE WAS OBSERVED	DEVEL	LOPMENT OCESS	OLIALIFICATI			LAUNCH OPERATIONS		
	13 ENVIRONMENT WHEN FAILURE WAS COSERVED	AMON		AADIATION D	河 TE		THEETSAL VAC	HRS AT	
	14. DESCRIPTION OF FAILURE	AT	SZK	HZ FR		A -		5:-2.2	4 dB
	(SHOUL)	35		,50 T		01.) C	H. 6 021	٠,	
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L	15. TEST PROCEDURE		597	PAR	46 B	AVISA	22/3	10-5- BI	17. CONTINUATION SKEET USED
Z	10. VERIFICATION AND FAILURE ANALYSIS	3				·			·
EVALUATIO			· · · · · · · · · · · · · · · · · · ·			·	· ·		
ME		 				10. FAILED ITEM HAM	1		
	20. D. I YLLOWING RE	WORK/RET	EST PEQUINGO	7.	/+	AND PART NUMBE	<i>* j</i> · · · · · · · · · · · · · · · · · · ·	1015	
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33%	111/1/20	1/2/	THE O	1 = 2,9/	11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1 not los	might all flight	with Me	ich KR
ENGIR	MACKINI	<u>ار مع،</u>	ence fe	21.	AUTHOSUADOS:	y grans	it Compleme	DATE	Z CONTINUATION
-	23. REWORK/RETEST				IN I FEE	oneiges	p/ dale	1/10/8/	24. QA REWORK
TEST					٠.				
AND 1								14.	ZA. QA RETEST
	21 LIST ALL PARTS P	21 ACED T			. •	1	•		
AMUFACTURING	PART NUMBER		CHT SYM	PART LOT MUMBER	DATE CODE	MAGRIFACTURER	PROBAMA	E DEFECT	AMALYSIS NUMBER
Page				·			 		-
MUP					- 		 		
A	ZJ. REWORK BY	<u>t</u>		DATE OATE	23.6	STESTED BY	063	DATE	23. CONTINUATION
	30. CAUSE AND CORRECTIVE ACTIO	m 2/	locken	makin	Autin	selisti	in at the	to it and	1
	rollofs	من کر را	restoi	2 /1/	stall.	to opera	Part		
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28	22. DOCUMENT IMPLE	PENTING	WALKER	N 201	COPY A	TTACLEBI	ZHEET USED	11/1	11/4/1
EER	36. BASIC CAUSE	DESIG	N		MENT M		WIRING EAROR	□//pskNOWM	DEFECT CODE
ENGINEERING/RELIABILITY	OF VERIFIED FAILURE	C DEFEC	CHMENTAL TIVE PARTS	TEST EQUIPA			WIRING ERROR ROUGH HANDLING; WEAR-OUT	7	
	35. FAILURE TYPE	D PRIMA		UNKNOWN NO FAILURE		38 FAILURE CHRESIFICATION	CRITICAL MAJOR	SAFETY	Toate
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011	773 SC JAN 60					1.112			

Program Instruction 010

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REQUEST FOR DEVIATION/VAIVER

IZEE AIC-210-450 ON 181 ION INCLINES	-					
SBRC, 75 Coroman		Ca. 931	17	1. OEVIA		MUTOB CHILICAT
4. DESIGNATION FOR DEVIATION		S. GASE LINE	MIEC:ED	The second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second secon		HER SYSTEMS/CONFIGU.
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SPECIFICATIONS AFFECTED.T	EST PLAN		6.	DRABINGS A	FECT	19
₩8. CODE \$9€C./90C.	NO. SCH	w/0. cose	KQ	D40-5 D	osa.	1000. 100,
e. SYSTEM		11323	50	904-4	c	
e. TEST PLAN		11323		704-4	- 5	
Permission to use Band 4 Pos	stamp SN 201			ASSURAGE.	13. co	NAS 5-24200
Radiometer		II. CD NO.		14. SEFECT	LASSI	
Band 4 Postamplifier	50904-4	17. LOT ₩3. 201	10.077	10. 8(0:21	-6 0EV	ATICE/ESIVER
None if approved.		None	if appr			
EX. EFFECT ON INTEGRATED LOGISTIC SUPPORT, IN	ERFACE, ETC.					
23. DESCRIPTION OF DEVIATION WAIVER					-	

Permission to use Band 4 Postamp with Ch 6 frequency response -2.24 dB down vs a specifiation of -2.5 to -3.0 dB down at 52KHZ.

This parameter is in violation of a unit level specification; not a system specification. Rework to the Postamp PWB may result in a lifted pad. The Band 4 Band Level Assy has been bonded into LED bracket and can no longer be cooled to allow reselection of resistors. Rework is not considered necessary since Wide Band Noise of Channel 6 is 2.1pA.

REA MANUELL SYS ENG	R Photos	1 15	DA <u>A//0/</u> PE <u>K</u>) 	<u> </u>
15. PRODUCTION EFFECTIVITY SV SERIAL MUMBER	7		V		
Mars for J Engl	10:56	Minor - Sy: Major/Crit:	stem Engine ical - Prog	ering ram Manacer	
	27. AFP90VAU. 3154F	PECAME			
APPROVAL PECONNENDED	5	Z . P. P. POVED	0154	PPPQYED	
C. MICHARCHT ACTUALTY	31 314	C-6	11:11	SATE/	
NASA GSFC.	1/2	200 CD B.	Bitt	11/30/21	
DD " 1694		1			-11001

MAIN AHR 50904-43 OPN. 1300 SPACE AND COMMUNICATIONS GROUP

· 50904-43

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FAILURE REPORT

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П	1. PROGRAM NAME AND NU	TM	2 GLA		FLIGHT	FIRST SAUP	S. DATE OBS	BAVED DA 25 YR 8/
		PACECRAFT YSTEM	SUBSYSTEM			MODULE	CARD PART	,
	EQUIPMENT IDENTIFICATION:		NAME		PART NUMBE	R S/N	A	ANNUFACTURER
	7. SUBSYSTEM							
	& UNST EXCTROY	ucs //	nodule_	,				
Ę.		UBASSEMBLY	BANB 3 Pa	st-App	50904-	¥3 201	SB	RL
¥	IG I WOODILE I WICKTH	CARD.						
۵L	II OTHER							
9	OBSERVED U	EVELOPMENT LPROCESS	OUALIRCATION ACCEPTANCE	3. C 3.	TEGRATION . C	LAUNCH CPERATIO	MS	
L	WAS OBSERVED E	MBIENT VIC/RFI	MOITAIGAR NOITAIGH	ELTS AXIS		THERMAL VAC	TA @RH RBHTO []	·
-	OF FAILURE CH.	1,7,8,	13,15	D.C.	OFFSET	OUTOF	SPEC	SHOULD
-	£ 1.01	3 V	M. 1 - 1.16	LH.	-1.2V C	N. 8 +1.	ZW CA	13-1.50
	18. TEST PROCEDURE	97	PARA	18. OA	Constant Con Record	000 221	3 08-25	17. CONTINUATION
Z.	18. VERIFICATION AND FAILURE ANALYSIS	gnnels	1.7.8.1	3.15	apparentle	e out o	A Spec	due to
E .	post-gain	csistor	s being	out a	wring to	rting		
EVALUATION		•		·	IS FAILED ITEM NAME AND PART RUMGE	11/1		
	20. TOLLOWING REWORK	RETEST REQUIR	so <i>(1)</i>	, ,	AND PART NUMBER	W/A	/	·
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	with pasj	-doin	े दर्शिक्षेट्र	QUITE	Refer 7	O Ellas	JE III	2572 LOLR
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	NOME K	egulye	T. NO D	ver-st	ressing or	t Country	nems	ZI QA AETESY
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OME TO	29. UST ALL PARTS REPLACE	CKT SYM	PART LOT NUMBER	DATE CODE	MAKUFACTURER	***************************************	ale gefect	ANALYSIS NUMBE
اڅ	110ne	CAT STA	PART (OT NOBISER	UATE COCE	- WARDPIACTORER	PROBA	rce vereci	Areas (13.13 requise
ZI-	AUVIC	1		<u> </u>				
MARIOFA		1			 	 		
3	ZZ. REWORK BY	_	ORG DATE	ZA. A	ETESTED BY	ORG	CATE	23. CONTINUATION
T	30. CAUSE AND CORRECTIVE ACTION	occ cl	ranged ne	r E.C.	Ra#25/	2/0/RJ	. To de	fine
ſ	role of	post-	agin resi	stors	in D.C.	07156	+ 00/	tage
	measurein	ents	Ne' spec /	mits 4	ice bosed	04	31 FRE CLOS	SURE
E [calculations	that	toke goi	n into	Considen	tion.		
5					OF SE	Comes 1/1	2/2///	Man Man
	NOTE: REV. e	TOF	SPEC. 165	97 100	ORPORMES	- FOR		in W
5	In 25/2/0181.	EFFE	TIVITY 15	5/100	g of up.	31. CONTINUATION	110	11.12
	22. DOCUMENT AMPLEMENTIN	FLL.	+TM2512/0	IRI to	Spec 165	97	7	UKJIZL
ERGINEENING/RELIABILITY	OF VERIFIED E	SIGN IVIRONMENTAL PECTIVE PARTS	TEST EQUIPMENT TEST PROCEDU	RE 🔲 AS	G. PROCEDURE CANADAN CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR C	WIRING ERROR ROUGH HANDLING WEAR-OUT	☐ UNKNOW	WHI DEFECT, CODE
ES :	S. FAILURE) CP	NIMARY OUCED	UNKNOWN MO FAILURE			CRITICAL WAJOR	SA MIRE	
1	TO RESPONSIBLE ENGINEER	/		TE/1/2/	II SPACE SAFT S	EM ENGINEER	22	-61 P11116
	S SECTION LE	·	5/-4/ 1/		TO JEST OMER ON SUP	PUEN		DATE
71187	3 SC JAN 80			17/8/	IIF/2			

SPACE AND COMMUNICATIONS GROUP

FAILURE REPORT

	el secundo, california					
	1. PROGRAM NAME AND NUMBER	2 GLA	FLIGHT	FIRST SHIPT	MO /O DA 04	YR 8/
	4. HARDWARE LEVEL SPACECRAFT SUBS WHEN FAILURE SYSTEM UNIT			MODULE .	CARD PART	
	EQUIPMENT IDENTIFICATION:	MAME	PART NUMBE	R S/N	MANUFACTI	IRER
	7. SUBSYSTEM			·		
1	& UNIT Electronics Module		<u> </u>			
E	* MASSEMBLY D SUBASSEMBLY BAND	4 POST BEST	50904	-34 24	SBRG	
DRIGINATOR	10. D MODULE D MICAM D CARD					
18	11. OYHEA		·			
80	OBSERVED IN-PROCESS Z ACCE		TEGRATION (LAUNCH OPERATIONS		
	13. ENVIRORMENT AMBIENT RADIA WHEN FAILURE GENCIRR VIERA			THERMAL VAC	HRS AT	
ı	14 DESCRIPTION CH. 6 8 OUT	OF SPEG	OFFSES	VOLTHO.	e SHOUL	o Be
	I 1.0V. 15 CHG +1	1.3 V CH	. 8 +1.51			
		· · · · · · · · · · · · · · · · · · ·		0		
L	18. TEST PROCEDURE 16597	PARA IN OR	KIMAZOR R	ae 2213	18-0481 B	CONTINUATION SKEET USED
20	18. VERIFICATION AND CHAPTER 6, 8 G	apparently o	ut of sac	e due to	gost-gai	n
EVALUATION	resistors being out de	sting tes	<u>t </u>			····
ALU		<u> </u>	Tio Sauce lygan halos		· · · · · · · · · · · · · · · · · · ·	·
		<u> </u>	18. FAILED ITEM NAME	NA		<i>y</i>
ENGINEERING	20. O FOLLOWING REWORK/RETEST REQUIRED 5% REWORK/RETEST NOT REQUIRED RECAUSE (10)	unels 6,8	actually	meet soe	- as tested	with
FER	post-gain resistors out	Refer to	ECR# TA	12512/01:	RI OF Spec	1/2597
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1	voltage offet calculations.	23' AUTHORIZATION		ORG		CONTINUATION CORU TESME
E	ZL REWGÁK/RETEST ACTION TAKEN				24. (DA REWORK
TEST	None Required. No ove	r-stressing	at comp	onents ac	curred	DA RETEST
AND	<u> </u>					TW MELES!
	28. LIST ALL PARTS REPLACED		,	T		
MANUFACTURING	PART NUMBER CKT SYM PART LOT NO	JMBER DATE CODE	MANUFACTURER	PROBAGLE	DEFECT ANA	LLYSIS NUMBER
PAG	None					···
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		570		31. CONTINUATION SHEET USED	Jan 1	1/121
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	Will and die	2 11/4/8 DATE	40. SUSTOMEN CIT SUP	PUER/	DAT	1116
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ORIGINAL PAGE IS AND COMMUNICATIONS GROUP OF POOR QUALITY

MUGMES AIRCRAFT COMPANY
SPACE AND COMMUNICATIONS GROU
EL SEGUNDO, CALIFORNIA

FAILURE REPORT

\$ 8327

_	EL SEGUNDO, CALIFORNIA	6 8-406			
	1. PROGRAM NAME AND NUMBER	y 2 GLA	FLIGHT	FIRST SAFFT	S DATE DESERVED - MO 09 DA 26 YR 81
	B. HARDWARE LEVEL SPACECRAFT	SUBSYSTEM UNIT	ASSEMBLY DISUBASSEMBLY	MODULE	CARD PART
	EQUIPMENT IDENTIFICATION:	NAME	PART NUM	BER S/N	MANUFACTURER
	7. SUBSYSTEM				
	B. UNIT Elaterics	midile			
	S ASSEMBLY U SUBASSEMBL	Module		711 301	C204
6	16	Y POST AMP BA	NO 4 50904.	-34 201	SBRC
¥	II. OTHER				
ORIGINATOR					1
e e	OBSERVED IN-PROCESS	T QUALIFICATION ACCEPTANCE	INTEGRATION SYSTEM	LAUNCH OPERATIONS	
	13 ENVIRONMENT AMBIENT WHEN FAILURE DEMORPH	RADIATION USERATION		THERMAL VAC	NRS AT*
	OF FAILURE CH 5	8 12 13 0	out of Spec	OFFISET VO	LTAGE SHOULD
	BE \$ 1.0V	15 CH. 5.	+1.5V, CH. 8	+2.5V, C	H. 12 +1,5V
	CH. 13, +1,3 V.	10.0			
	15. TEST PROCEDURE 659	7 PARA	4 IS ORIGINATOR R. C	22/3	DATE 17. CONTINUATION SHEET USED
8	18. VERIFICATION AND FAILURE ANALYSIS CHORRE	15 5, 8, 12, 1	3 apparently o	ut of spec	due to :
EVALUATION	post-gain res	isters Bei	ig lifted du	ring Test	ing.
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			18, FAILED ITEM NA AND PART NUIS	BER N/A	
engineering	20. O FOLLOWING REWORK/RETEST REC SE REWORK/RETEST NOT REQUIRED		5,8,12,13 00	tually meet	t spec as tested
328	with partigain re	sistors out	Refer to E.C.	3. TM2512	love of spec
5	16597 Red I for	allowable u	offige officts.	See altad	sed for allowable
S	collogs offseta calcu	elations.) 2" Au	HURTASINO	ORG	DATE CONTINUATION SHEET USED
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Ž	27. REWORK BY	OAG DATE	20. RETESTED BY	OAG	DATE 23 CONTINUATION SHEET USED
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	on colculations	11	in into cancio	leration	1
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132	NOF: REV. J. OF SA	51, 2	ORPORATES GUE	31. CONTINUATION SHEET USED	Month 12/21
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ERI	D DOCUMENT IMPLEMENTING ECH	# TM 25 /2 /	<u> </u>	02//	UNKNOWN DEFECT CODE
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1-20 6	35. FAILURE / PRIMARY	UNKNOWN NO FAILURE	CLASSIFICATION		MINOR SAFETY
1 ,	FOR THE PRODUCTO		33. SPACECRALA SA	DEM ENGINEER	
1 1	TT. RESPONSIBLE ENGINEER	ORG DATE	シングノート コンイノ・		ワフィルル ペノカノ ノ
1 1	TO RESPONSIBLE ENGINEER	ORG DATE	WALUSTOMAN CH S	MAPUER STATE	22-61 81 81 16
	1.11 14 -01/18	111	4/5/ 1 16	UPPLEN	22-6101811h

SPACE AND COMMUNICATIONS GROUP FAILLIRE DEDORT

5P (HUGHES AIRCRAPT COMPANY ACE AND COMMUNICATIONS GROUP EL SEGUNDO, CALIFORNIA		REPORT		5	8329
	1 PROGRAM NAME AND NUMBER	2 GLA	3. MODEL FLIGHT	L TIME OBSERVED FIRST SAHFT	S. DATE OBSERVED	01 YR 81
	O. HARDWARE LEVEL SPACECRAFT SUBS	rSTEM TO A	SSEMBLY (MODULE NICAM	CARD PART	
		AME .	PART NUMBER			ACTURER
	7. SUBSYSTEM					
1	& UNIT Electronics Module					
	8. AASSEMBLY USUBASSEMBLY BAND 2		50904-	2 201	SBR	<u>C</u>
Ē	10. MODULE MICAM CARD		00707		0,0	
3	11. OTHER	· · · · · · · · · · · · · · · · · · ·				
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3	testina.)	1 × × × × × × × × × × × × × × × × × × ×	
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2	calculations that take	agin in		ration.		
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ايرا	11-4 51-4	17/18/81	STOMER OR SUP	<i>-</i> "		

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HUGHES AIRCRAFT COMPANY SE AND COMMUNICATIONS GROUP ORIGINAL PAGE IS OF POOR QUALITY

SPACE AND COMMUNICATIONS GROUP FAILURE REPORT

	el segundo, california					
	1. PROGRAM NAME AND NUMBER THEMSTIC MARRIEL	2 GLA	1 MODEL 4 TO	45 C8SERVED	S. DATE OBSERVED	16 YR /2
	C. HARDWARE LEVEL SPACECRAFT SUBS		SSEMBLY MO		CARD PART	<i>H</i> .
		IAME	PART NUMBER	S/N		ACTURER
1	7. SUBSYSTEM		PANI NUMBER	3/4	MARU	ACTUREN
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	e unit elements module		52347	201		
5	2 C ASSEMBLY SUBASSEMBLY					
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İ	CDVU and RADIOMETER TOLERAN		D CH HI/LO LINE	SFECS - B	OTH READING	S SPEC
L	19. TEST PHOCEDURG 16704	4.23.9	GINATCE TUYTEN	22-13	GAMELL.	17. CONTENUATION
8	18 VERIFICATION AND FAILURE ANALYSIS TO 16704	423.9.36	SEES LOW	Last f	mer Su	767
EVALUATION	INPUT TO 21(+5,-0)	V)es	Hourd Have	Pari) T	(97E)) <i>(</i>	7
13	23 (+.5 -0) VDC	ct	VU and Radioms	cter Witag	a toleran	es should
EV	have been reversed		IR FAILED ITEM NAME AND PART NUMBER			
ENGINEERING	23. ☐ FOLLOWING REWORK/RETEST REQUIRED ☐ REWORK/RETEST NOT REQUIRED BECAUSE	•				
193	RETEST PER PARA A	23.9.26	EO 4180 A			
3EM	P					
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EVA				19. FAILED ITEM NAME AND PART NUMBER	J		
	20. 2 FOLLOWING REWOPK/RETEST REQUIRED DECAUSE DECAUSE	Correct	TP 16704	Para 4.19.11	hru 4.19.4 S	ec Limits	to conform
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9		[2] A(1)	THORIZATION /		ORG	LOATE	122 CONTINUATION
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AND						····	(%)
2	28. UCT ALL PARTS REPLACED			<u> </u>			
12	PART NUMBER CXT SYM P	ART LOT NUMBER	DATE CODE	MANUFACTURER	PROBABLE	DEFECT	ANALYSIS NUMBER
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HEL			,		31. CONTINUATION SHEET USED	1/1/1/500	
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EE	CORRECTIVE ACTION EO 4659	TEST EQUIPMEN	NT OME	G. FROCEDURE	WIRING ERROR	- UNKNOWN	DEFECT CODE
ENGINEERING/RELIABILITY	OF VERIFIED CEPTONMENTAL	TEST PROCEDU	RE 🖸 AS	SY/FAB ERROR	ROUGH HANDLING		
E	TYPE INDUCED	C UNKNOWN S NO FAILURE		38. FAILURE CLASSIFICATION	CRITICAL MAJOR	国 MINOR □ SAFETY	
İ	37. PESPONSIBLE ENGINEER	22-13 DAT	1/28/82	STARECHAFT SYST		SPEC	2/2/82
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SPACE AND COMMUNICATIONS GROUP FAILURE REPORT

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Γ	1. PROGRAM NAME A THEMAT		ER Z GLA		1 MODEL FLT	11:30 A.M	S. DATE OBSERVED	28 YR 82
	8. HARDWARE LEVEL WHEN FAILURE WAS OBSERVED	SPACECRAFT SYSTEM	C SUSSYSTEM		SSEMBLY UBASSEMBLY	MICAM	CARD PART	
	EQUIPMENT IDENTIFICA	TION:	NAME		PART NUM!	BER S/N	MARUF	ACTURER
	7. SUBSYSTEM							······
	8. UNIT ELE	ECTRONICS	MODULE		52347	201		
	9. 5 ASSEMBLY	SUBASSEMBLY R	EDUNDANT SHI	ITER DRIV	ER 51398	101		
ATO	10. I MODULE I M		<u> </u>	TICK OFF	31513			
3	11. OTHER							
OKIGINATO	12. TEST WHEN FAILURE WAS OBSERVED	DEVELOPMENT DIN-PROCESS	QUALIFICATION	i 🔲 imi	TEGRATION STEM	LAUNCH OFERATIONS	· ·	
	13. ENVISONMENT WHEN FAILURE WAS OBSERVED	AMBIENT DEMC/RP	RADIATION VIBRATION	☐ TE		THERMAL VAC	HRS AT	
	14. DESCRIPTION OF FAILURY	WHEN MAIL	SKYTTER O	N (CMD	13) ISSUED	THE REDUND	ANT SHITTE	R DRIVER
	WAS NOT	COMMANDED	OFF					
	15. TEST PROCEDURE	16704	1 PARA . 4.12	4.7 18. OR	GINATOR Banach	CHG 122 13	1/28/82	17. CONTINUATION
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-121	<u>future plan</u>	ning operati	ons. AM	14/82		31. CONTINUATION	11. ~	A
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SPACE AND COMMUNICATIONS GROUP FAILURE REPORT

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HUGHES

SPACE AND COMMUNICATIONS GROUP FAILURE REPORT

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_	EL SEGUNDO, CA							
	: PROGRAM NAME A THEMATIC	MAPPER	1 GL	A	1 MODEL FLT	17:00	MO / DA	26 YR 82
	6. HARDWARE LEVEL WHEN FAILURE WAS OBSERVED	SPACECRAFT SYSTEM	☐ SUBSYSTEM		SSEMBLY UBASSEMBLY	MOCULE	CARD PART	
i	EQUIPMENT IDENTIFICA	TION:	NAME		PART NUMB			FACTURER
	7. SUBSYSTEM							
	& UNIT C. S.C.	TRANKS					 	
	9. M ASSEMBLY		DULE		52347	1201		
5	10. MODULE II W	SUBASSEMBLY RE	DUNDANT SH	WHER DANYE	<u> 51398</u>	201	ļ	
RIGINATO	11. OTHER	CAR C CARS		<u> </u>			ļ	·
E	12 TEST WHEN				<u> </u>		<u> </u>	
5	FAILURE WAS	DEVELOPMENT	OUALIRCATIC BE ACCEPTANCE			LAUNCH OPERATIONS		4
	13. ENVIRONMENT WHEN FAILURE	AMBIENT DEMC/RR	RADIATION VIBRATION	C) TE		THERMAL VAC.	HRS AT	
	WAS OBSERVED 14. DESCRIPTION OF FAILURE RE			AXIS			_ C OTHER	
			TER PHASE			ORD G PIT	**	NORPECTLY
	HI WHEN	ME REDUNDAN	IT SHUTTER	FUNCTION	IS COMMANI	DED OFF (CM)	> 'oF")	
	15. TEST PROCEDURE		[PARA	1:8, OR	IGHATOR .	ORG	DATE	17. CONTINUATION
L	TP167		14.17	2.42		22-13	1-27-82	SHEET USED
3	FAILURS ANALYSIS	REDUNDANT S	HUTTER DRI	VER (5139	PHASE LOC	K SIGNAL U	24 Pas 14 b	OES NOT
ATION	HAVE PULL DO	WH RESISTOR TO	ALLOW EXTE	RHAL REC	EIVING TTL I	C. TO READ S	GHAL CORP	ECT! WHEN
	51398 IS Par	WEREQ OFF.	PULL DOWN	RESISTOR I	R168-8 1 1 1 100	RECTLY WIRED	TO WIZ PAN	m. SHOULD BE
EVALU	B168 - BLPW	IRED TO WIZ	PIN II		AND PART HUME	H MONE		,
	TO THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF TH	MCRE/RETEST REQUIRED IT NOT REQUIRED BECAUS	- MANE BU	O B COUNTY	7 TED 19105 6	Can 1117 Day	1/1 Th 11 12	Dank 18
ENGINEERING				/	HED BOIRE P	KOM WIZ PIN	10 10 1414	PIN IL
3	RETEST	PER_TP16	104 PARA	4.12.4			 	
200			121 A	JTHORIZATION .		TORG	T DATE _	22 CONTINUATION
E				A Bana	sh	22-13	1-27-82	ES SHEET USED
1	ACTION TAKEN	REGIORK	es ro	UBLUE!	MINT AS	IN CINE	<u> </u>	24 POR WYORK
TEGT								1//
AND	R	ETESTED	PER	PARA	4.12.4.2	CARRECTLY		To Open Bert Z
								(3) 3
ANUFACTURING	28. LIST ALL PARTS RE		PART LOT NUMBER	DATE CODE	MAMUPACTURER	PROBAGLE	DEFECT	ANALYSIS NUMBER
12								
FAC							·	
3					<u> </u>	·		
MA	D. Towos		AG 22-74 04/2	23. F	ETESTED BY	ORG 22-13	1/28/82	29. CONTINUATION SHEET USED
٣	30. CAUSE AND			ing of U	12 lein 11 hu	assembly pe		
	during insp		COTTECT WIT	ION: 1)	Assembly Si	pervisor was	informed	of the
							31. FRB CLOSURE	
_	error and h	as instructed	tion Super	visor al	exercise gi	of error and	į.	ıA ·
=	in the lucu	tedinispector	Julia Super	V 1301 Q1		future	11	
AB			rs to exerc	ise grea	ter care in	(uture	111	NAME OF THE PROPERTY OF
REL	inspections	· (XYX)				Las CONTINUATION	11/1/	1 1172
0		<i>y</i> 5				31 CONTINUATION SHEET USED	1//3	1411
8	32. DOCUMENT IMPLEA CORRECTIVE ACTIO	IN .				-	1 2	
ENGINEERING/RELIABILITY	34. BASIC CAUSE OF VERIFIED FAILURE	C DESIGN C ENVIRONMENTAL DEFECTIVE PARTS	TEST EQUIPMED TEST PROCED	URE A AS	FG. PROCEDURE ISY/FAB ERROR ORKMANSHIP	WIRING ERROR ROUGH HANDUNG WEAR-OUT	☐ UNKNOWN	DEFECT CODE
ER	35. FAILURE	PRIMARY	UNKNOWN		35 FAILURE	C CRITICAL	MINOR	<u> </u>
	TYPE 37. RESPONSIBLE ENGL	☐ NOUCED	ORG C	ATE/	CLASSIFICATION REPACE CRAFT SYS	TEM ENGINEER	SAFETY	DATE / Las
	Ga	Bonach	122-14 1	128/82	1.6 spinos	to JEnne	1 SBRC	2/4/26
	39. RELIABILITY	<u> </u>	ORG -	ATE	A STANSOCKER OF SU	PPUER	· .	DATE
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SPACE AND COMMUNICATIONS GROUP

FAILURE REPORT CONTINUATION SHEET

e and communications group el segundo, california ADDITIONAL FR CONTINUATION CHESTION USED "LABEL FIRST CONTREVATION SHEET USED 'A', ESCOND 'E', ASS SO ON - identify entries by referencing friction rusesed in Column, date lach entry. REDUCED LOAD NOT CONNECTED CUERENT THEOUGH OCCUPRED OF ORIGINAL PAGE IS OF POOR QUALITY : -D11873A JAN 80

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FAILURE DEDAGT

	EL SEGUNDO, CALIFORNIA	1	# 0~#8				- .	•
П	I. PROGRAM NAME AND NUMBER		2 GU	· · · · · · · · · · · · · · · · · · ·	1 MODEL	4. TIME OSSERVED	5. DATE OBSERVE	
	O. HARDWARE LEVEL SPACE	HOER	51100100000		BLT	The same		14 YR-82
	WHEN FAILURE STACE	M 8	SUBSYSTEM UNIT		SSEMBLY UBASSEMBLY	MICAM	CARD PART	
1 1	EQUIPMENT IDENTIFICATION:		BMAN		PART NUMBE	A S/N	MANU	FACTURER
	7. SUBSYSTEM					·		
۱	8. UNIT	elsch	lames	MOULE	52347	201		
E.	9. C ASSEMBLY - SUBAS					÷		-
100	10. EL MODULE I MICAM I C	AND ELETHA	C) MAR	DVLE				
Z	11. OTHER							
ORIGINATOR	12. TEST WHEN DEVELO		SUALIFICATIO ACCEPTANCE	N		LAUNCH OPERATIONS	•	
	12 ENVIRONMENT AMBIE	NT 🛄	ADIATION	πε	kip	THERMAL VAC	HAS AT	
1	WAS OBSERVED EMC/R	5	//BRATION	XIS 1			OTHER	· · · · · · · · · · · · · · · · · · ·
	OF FAILURE SMAIL		BEVILL			15 38/2	30,5 VDC	
	SMA	-	asure		Py Seec	12 -581 F	-30.5 VD	€
	15. TEST PROCEDURE		4.23 9.		CHAYEN	.CAS	DATE	117. CONTINUATION
Ц	19. VERIFICATION AND		<u>ع. والدح.</u>		(GUYTIN)	23-13	17 Fes 1/2	SHEET USED
8	FAILURE ANALYSIS THE	<u>SMA ± 25</u>	f. out	Vis and	ER FULL L	AR COMBITION	rs read	Sco Me
EVALUATION	OUT OF SPECIFIC	Atteds As	PRITA KW S	LY DEPLA	ED M POWE	e supply the	igh spec	THE
3	POWER SUPPLY RE	ia depar	\$ 73160	<u> </u>	AS COREC	<u>{</u>		
EV					19. FAILED ITEM NAME AND PART NUMBER			
	20. O FOLLOWING REWORK/RETE		HE TE	ST PRESEND	re to Jeeu	FI 28 to 31 v	Co Em SIA	A +2816
PREFRING	Modify	7657 PS	A CONTRACTOR		507,64	7	1.8 VDC	
394	VIA E.C		d Const	RM D P	WER DIFFLY		603 REV B	HE 19 STA COV
ENG	7777	<u></u>		THORIZATION	1	ORG	DATE	ZZ. CONTINUATION SHEET USED
-	2 ROWORK/RETEST			-74-A		- 18-18	2-27-82	24 OA REWORK
TEST	ACTION TAKEN HEN	<u> </u>						ł
5						·		25. QA REFEST
AND		 					· ,	1
윤	24 UST ALL PARTS REPLACED			T		1		
URI		CKT SYM PART L	RSBMUN TO	DATE CODE	MANUFACTURER	PROBABLE	DEFECT	ANALYSIS NUMBER
CTUR				 				
NUFA	<u></u>					ļ		
MAN		ORG	DATE		ETESTED BY	ORG	DATE	30. CONTINUATION
3	27. REWORK BY	UAG	Lua. e		2123125 01	June	2 2 2 2 2	29. CONTINUATION SHEET USED
	CORRECTIVE ACTION TE	st specifi	LATION	MODE	astencies	CORREGED	TOLER	BNCE
	INCLEASED TO	+281	431/	TO TO	28 < V < 3	BI VDC AN	s -28< V	< -31 VZC
							33. FAB CLOSURE	
E							}	
盲]	I)
¥							1 11	N. 182
/RE						31. CONTINUATION	Mac	No 12510
밁	32. DOCUMENT IMPLEMENTING	CA . 11 - C	2 6 5		371 11	1609	1/1/1/00	7/5/
띪	CORRECTIVE ACTION	EO 4150	EST EQUIPME	NT Q VE			UNKNOWN	DEFECT CODE
ENGINEERING/RELIABILITY	OF VERIFIED C ENVIRO	INMENTAL BY	EST PROCEDI	JRE 🔲 AS	G. PROCEDURE SY/FAB ERROR DRKMANSHIP	ROUGH HANDLING		
Z	35. FAILURE C PRIMAR	RY E (NKNOWN	.	38. FAILURE	C CRITICAL	MINOR SAFETY	
ì	TYPE INDUCE	OR		TE	CLASSIFICATION 38. SPACECPAFT 355	EM ENGINEE	ORG	DATE
ı	39. 16 ABOUTH D	OR	2-43 2	TF.	SOSTIMENTA SUP		77-41	2/25/80
Г	- +	, 05	- /// 153	0	V 101 22	7		1 7
	la Lesta		4/ 3	1-21-82	4.9.			

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SPACE AND COMMUNICATIONS GROUP FAILURE REPORT

S 8407

	EL BEGUNDO, CA	 · 						
	1. PROGRAM NAME A	ND NUMBER	2	GLA .	FLIGHT	4. TIME OBSERVED	MO 07 D	A/5 YR E/
	6. HARDVIARE LEVEL	SPACECRAFT SYSTEM	EYEBUZ EL		SSEMBLY (MODULE MICAM	CARD PART	.,,
	EQUIPMENT IDENTIFICA	TION:	NAM	£	PART NUMBER	S/N	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	NUFACTURER
	7. SUBSYSTEM				1)	ull		
	B. UNIT ELECTI	RONICS MODE	ur E		52347	学		
-	9. ASSEMBLY	SUBASSEMELY			50904-	¥ 201	SBR	.C.
2	10. ANDOULE IN	ICAM C CARD				~ 301		
Z	11. OTHER				-			
ORIGINATO	12. TEST WHEN FAILURE WAS OBSERVED	DEVELOPMENT	OUALIFICA MACCEPTAI		TEGRATION C		<u> </u>	
	13. ENVIRONMENT WHEN FAILURE WAS OBSERVED	AMBIENT DEMC/RR	RADIATIO			THERMAL VAC	HRS AT	
	14. DESCRIPTION C	45 P8	3 15 60			OKA RET		Severa Palay
	Cu Ist A			7	6 17.4Km	031.41	—	oned BE 20.5
	<u> </u>	. / 5 / 5 &	- Company	A TO CO COMP CO CO	<u>s ////////////////////////////////////</u>	<u> </u>	1.14 11,31	0000 68 2010
		6597	PA	4.5 Ta OFF	GINATOR ZON	a 22/3	07-15-C	17. CONTINUATION SHEET USED
Į.	18. VERIFICATION AND FAILURE ANALYSIS	VISUAL	ANAL	Y 5/5	SHOWS	RES É A	267 RE	EVERSED:
EVALUATION	R31 &	ROS Per	ERSED.	R95 (PRE	GAIN) SHOULD	HAYS BEDJ	17.401	
S	883100 EA	SHOULD HAY			ROLLAFF) SHOW			
M	R31 (OFFSET)	SHOULD HAVE		. C'4	18. FAILED ITEM NAME AND PART NUMBER		- 00-72	
	20. A FOLLOWING REV	NORK/RETEST REQUIRE	0	4.35		1	· · · · · · · · · · · · · · · · · · ·	
GINEERING	AEWORK/RETES	T NOT REQUIRED BECA	USE CE	WORK TE	PRINT	E CONT	INUP	TEST.
13		<u> </u>						
ě				V MA		5- 1086	Cours	
1				2016 X	Jauxon.	2213	7-15-8	1 22 CONTINUATION SHEET USED
TEST	21 REWORK/RETEST ACTION TAXEN		ices Re	รรคบบอ	PROPORLY.			ZA CA CONSTR
	NO OVERSTR	ess per H.	5236-7699	4 AND H.	523/2-7556			25. QA RETEST
AMD								750
1 1	**							(
CTURING	28. LIST ALL PARTS RE PART NUMBER	CXT SYM	PART LOT NUMB	ER DATE CODE	MANUFACTURER	PROBABLE	DEFECT	ANALYSIS NUMPER
	NONE							
NUFA								
								·
ž	27. REWORK BY		ORG DAT	E 20. A	ETESTED BY	ORG	DATE	29. CONTINUATION SHEET USED
П	30. CAUSE AND CORRECTIVE ACTIO	N WORKMAN	SHIP ERPO	R WHON M.	WING SELEC	T RESISTORS	S FROM	STANDOFFS
					7. HAVE BET			E CARLE
				· • · · · · · · · · · · · · · · · · · ·		INSPECTION	31 FRB CLOSUR	
اح	WHEN REMO				- RESISTORS	, 	1	
		MANE REGAL	INTUBUCLE			•	1	<i></i>
3	IN INSPECT	INC SELECT	INSTALL	ATRUS AN	O EURRAND		1 1	
띭						Remote 31. CONTINUATION		1610
è						31. CONTINUENTION SHEET USED	1 ///	אוטווי
3	2. DOCUMENT IMPLEM CORRECTIVE ACTION	N NONE	REDO	· · · · · · · · · · · · · · · · · · ·			1/9	417171
ENGINEERING/RELIABILITY	34. BASIC CAUSE OF VERIFIED FAILURE	DESIGN SHOULD DESIGN DEFECTIVE PARTS	C TEST FOUL	CEDURE 🛄 AS:	G. PROCEDURE SY/FAB ERROR SIRKMANSHIP	WIRING ERROR ROUGH HANDLING WEAR-OUT	ET UNKNOW	oered cho
ä	IS. FAILURE	PRIMARY	UNKNOWA	v .	38. FAILUIRE	CRITICAL MAJOR	MINOR ☐ SAFETY	· · · · · · · · · · · · · · · · · · ·
	37. MESPONGABLE ENGIL		ORG 27	10ATE 3-8/	3 SPACEC FOT THE		1991	1 211181
	39. AELIABILITY,	asy	ONG	DATE	TOBIER ON SCH	PUER		DATE
\sqcup	a. Hube	~	51-11	11-03-81	J.G.	_/		
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FAILURE REPORT

	EL SEGUNDO. CALIFORNIA					
П	1 PROGRAM NAME AND NUMBER VC/1 T. A1,	2 GLA		OBSEAVED	5. DATE OBSERVED MO & DA	6 YR 81
	8. MARDWARE LEVEL C SPACECRAFT WHEN FAILURE SYSTEM	SUBSYSTEM D	ASSEMBLY MODU	LE	CARD PART	
	EQUIPMENT IDENTIFICATION:	NAME	PART NUMBER	S/N -	MANUFA	CTURER
	7. SUBSYSTEM					
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SANTA BARBARA RESEARCH CENTER A Subsidiery of Hughes Aircraft Company .

INTERNAL MEMORANDUM

TO: L. O'Connell

CC: Altman, L.

DATE: 26 October 1981 .

Barnett, G.C.

REF: HS 236-7691

Davison, N.C. Randall, D.M.

REAH 81/53

SUBJECT: FR: S8446

Rangel, J.

FROM: A. Huber

(Band 4 Postamplifier Board, 50904, Flight)

Wilkerson, R.J. Data Bank (8)

BLDG. B-11 MAIL STA. 102

EXT. 6246

FR: S8446, dated August 6, 1981

The failure was encountered when retesting Band 4, channel 8, after select resistors were removed from standoffs and placed directly onto the 50904 postamplifier board. It was found that in moving the resistors to the board, two resistors were interchanged. The resistors were R28 (22.5K, offset) and R12 (3.65K, boost). The resistors were subsequently moved to their proper locations. Figure 1 illustrates the offset and boost circuits which resulted from the interchange of resistors. No overstress occurred.

AEH: jc

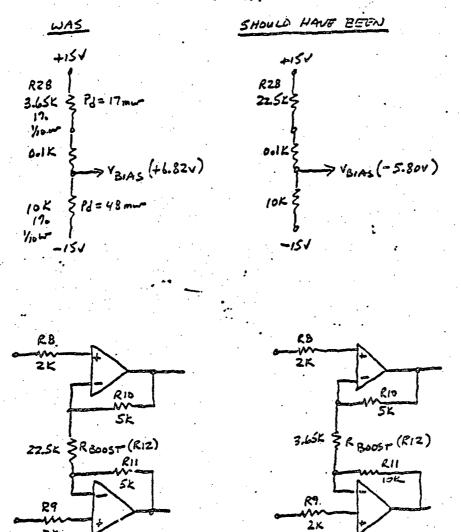


FIGURE L: OFFSET AND BOOST CIRCUITS RESULTING FROM
INTERCHANGE OF RZS AND RIZ.

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SPACE AND COMMUNICATIONS GROUP

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SPACE AND COMMUNICATIONS GROUP FAILURE REPORT

8456

	el segundo, california								
ORIGINATOR	PROGRAM NAME AND NUMBER	2 GLA	3. MODEL 4	SO SERVED	5. DATE OBSERVED	11 YR R1			
	O. HARDWARE LEVEL SPACECRAFT		SSEMBLY	ODULE	CARD	/			
	WAS OBSERVED SYSTEM (J UNIT S	UBASSEMBLY ME	ICAM S/N	PART	ACTURER			
	7. SUBSYSTEM		7 447 110/2021			ACTORICA			
	a. unit								
	9. ASSEMBLY SURASSEMBLY					····			
	10. O MODULE O MICAM BYCARO VERLE	WITH WHERE THE	50948	201					
	II OTHER								
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	OF FAILURE LAMED & ETALLED	ONCE DURING	DATE OFFICE	CAT O°	e (Lx10	para)			
	PRIMARY WORD G OVIDAT IS X'BD' SHOULD BE X'AD'.								
Ì	15. TEST PROCEDURE // AAA	PARA JIG ORI	CANDATOR .	1000	Date /	17. CONTINUATION			
L	19 MERIESCATION AND	5.4.13	GUY TOD	22-13	11/11/81	SHEET USED			
20	FAILURE ANALYSIS NOTE FR \$8309	AND SUBSEQUENT AM	BEHT TESTING DE	ALT WITH U	13 PIN 7 (G	ourer)			
JAT	SHORT TO GROUND BY SOLDER SP					FAILERS OF			
EVALUATION	1 OF 8 BITS IN WORD G ONCE IN	6 x 10° cyclis AT 0°C	IN CAUGO ITEM MANE						
	20. 28 FOLLOWING REWORK/RETEST REQUIRED		AND PART NUMBER (4:		= 40474-0-				
EERING	A REWORK/RETEST NOT REQUIRED BECAUSE	REMOVE 4 REPLACE	= u31 (90994	PO-1/					
	RETEST PER TP 16422 PARA 5.43								
ENGIR		21. AUTHORIZATION		ORG	DATE	22 CONTINUATION			
-	23. REWORK/RETEST ACTION TAKEN	Ja ps	nsep	72-13	11/12/81	ZA EST MYORIC			
TEST		PPL B & RETE	ST PER 5.4.	7 050 E	IRMED	(70)			
ND T	AND NO FAILURES OCCURRED								
GAG	110								
2	28. UST ALL PARTS REPLACED CKT SYM PART	LOT NUMBER DATE CODE	MANUFACTURER	PROBABLE	DEFECT	AHALYSIS NUMBER			
CTUR	209940-1 USI								
UFA									
MANUFA	27. REWORK BY ORG	DATE 40 22 R	ATESTED BY	ORG	DATE	29. CONTINUATION			
3	M- GUERRA 22-		שנידות	22-13	17 Nov 1/21	29. CONTINUATION SHEET USED			
	CORRECTIVE ACTION POSSIBLE U31 MARGINAL FAILURE DUE TO U31-7 TO U31-8 SWERT; OR DUE TO								
	HEATING TRACES AS PREVIOUSLY NOTED SOLDER SPLASH WAS REMOVED.								
_	17	PROBABLE ACTUAL CAUSE OF USI FAILURG NOT CLEARLY KNOWN.							
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IA	IMPOSSIBLE TO BEREMINE THE CAUSE LET STR 8309								
Q/RELIABILITY	22 CONTINUATION								
MI	37 DOCUMENT IMPLEMENTING								
ENGINEERIN	34. BASIC CAUSE Q DESIGN TEST EQUIPMENT WIFG, PROCEDURE WIRING ERROR WINKNOWN DEFECT CODE								
NG.	FAILURE Z DEFECTIVE PARTS	TEST SET-UP C WO	PRKMANSHIP WE	JGH HANDUNG AR-OUT	☐ MINOR	\			
	35. FAILURE SPRIMARY CHARLES TYPE CHARLES INDUCED	NO FAILURE	cuasification /5	CRITICAL	C SAFETY	10000			
1	Ja Barach 12	DAG DATE	18. SPAGECHAFT SETEM EN	ul	22 41	6 lan 37			
	STREET TOURS	59-41 13-6-81	STAMER CH SUPPLIER			₩			
3	73 SC JAN 80		1/7/82						

1/7/82





FAILURE ANALYSIS REPORT

FAR No. 9242 Program T.M. Page 1 of 2

DATE OF RECEIPT 12-9-81	TSD PROJECT ENGINEER 11. Gettys
F. Carle ORG 44-29 PHONE 80248 BLDG/MS \$13/D329 REA PHONE	PHONEBLOG./MS_STD/C346 GLA/CMER40833
COMPONENT I.C. FUNCTION/TYPE 8-Bit Shift Register GENERIC P/N 54L165 HUGHES P/N 909940-1 MFG. National P/N RD30371 OATE CODE 7827 S/N 1092	FAILURE REFERENCE FA81-281/FR S8456 DATE OF FAILURE 11-11-81 FAILURE LEVEL ASSEMBLY LOT NUMBER CIRCUIT SYMBOL U31 MODULE 50948 S/N 201

ABSTRACT

The reported failure, wrong output once in 6 \times 10 6 cycles and again once in 1.5 \times 10 6 cycles, was not confirmed. The device was found to be within all specified d.c. parametric limits. The rareness of the failure reported made it impossible to determine its cause.

TECHNICAL COMMENTARY

M NOT REQUIRED

O APPENDED

FAILURE ANALYST

K2127

JOURNAL

Limbacher

APPROVAL

DATE

FAR. 110. 9242 S 9 456 PAGE 2 of 2

Reported Failure:

"Hord G failed once during data cycling at 0° C (6 X 10° cycles). Primary word G is X 'BD' [hexadecimal coded output], should be X 'AD'.

Background Information:

"Note FR 8309 and subsequent ambient testing delt with U31 pin 7 (\overline{Q} output) short to ground by solder splash across traces, its removal, and proper functioning. The failure of 1 of 8 bits in word G once in 6 X 10° cycles at 0°C requires removal and replacement of U31."

Additional Information:

The device was retested the next day (after the one failure in (6 \times 10° cycles) for 1.5 \times 10° cycles. The same failure mode (output \times 'BD' instead of \times 'AD') was noted again once in the 1.5 \times 10° cycles.

Outline of Analysis:

4)

- 1. External Visual Examination
- 2. Electrical Testing
- 3. Internal Examination

Results of Analysis:

- External Visual Examination.
 - a) Markings: (National Logo) 7827 RD30371 •1092
 - b) Case Examination;

The leads were formed and solder tipped and there was orange transparent tape on the bottom of the package. No anomalies were noted externally.

Electrical Testing.

The device was tested for d.c. parameters on the Tektronix S-3260 automated I.C. tester per the 909940 specification at $+125^{\circ}\text{C}$ $+25^{\circ}\text{C}$, 0°C and -55°C . It was found to be within the specified limits for all of the parameters tested.

3. Internal Examination.

The device was opened and examined internally. No anomalies were noted.

Conclusion:

The reported failure was improper output once in 6 X 10° cycles and again once in 1.5 X 10° cycles. The device was tested for all specified d.c. parameters and passed. No anomalies were noted externally or internally. The extreme rareness of the observed failure made it impossible to determine its cause.

HUGHES

SPACE AND COMMUNICATIONS GROUP **FAILURE REPORT**

ORIGINAL PAGE IS OF POOR QUALITY \$ 8460

57	NUGHES AIRCRAFT COMPANY ICE AND COMMUNICATIONS GRO EL SEGUNDO, CALIPORNIA	- FAI	LURE	REPORT		5	8460		
	1. PROGRAM NAME AND NUMBER TM	2 GLA		1 wooa F4T	6.00	S DATE COSERVED			
	G. HARDWARE LEVEL G SPACECRAN WHEN FAILURE G SYSTEM	FT SUBSYSTEM		SEMBLY (MOOULE MICAM	CARD PART			
	EQUIPMENT IDENTIFICATION	NAME		PART NUMSER	S/N	MAMUF	ACTURER		
	7 SUBSYSTEM								
	& UNIT Electronia	Madube		523	47				
Œ	9. ASSEMBLY A SUGASSEM	SLY Auxillary Cu	ruit Boon	527	97				
ATC	10. C. MODULE C MICAM C CARD		<u> </u>						
RIGINATOR	11. OTHER					·			
ORI	12 TEST WHEN SAILURE WAS DESERVED DIN-PROCESS	ENT COUALIFICATION S CACCEPTANCE		EGRATION C					
	13. ENVIRONMENT AMBIENT WHEN FAILURE WAS OBSERVED BACKER	ROTATION	TEX AXIS F		THERMAL VAC	HRS AT.			
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Н	IB VERIFICATION AND					10/3/81	SHEET USED		
TION	FAILURE ANALYSIS INTEG	GRATED CIRCUIT		and ARZ	assembled a	ad installed	upside		
4	down. No over	stress to other	poard	components.	1 a Banache	Vular_			
EVALU	STREET ANALYSIS	- DUCUMENT	ED DN	Toc H	2776-726	and the same	ATTACHED)		
		3. / 21		19. FAILED ITEM NAMS AND PART NUMBER	ARIARZ	909997			
8	20. 25 FOLLOWING REWINELASTEST RE THE REWORK/RETEST NOT REQUIRES	EQUIRED PEROVE	and Re	place corre	ctly ARI a	ad ARZ.			
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ROIN			THORIZATION		ORG	DATE	22. CONTINUATION		
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5	ACTION TAKEN ARI and	ARZ removed	and rep	laced per B/	p		» Y		
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HUGHES

URIGINAL PAGE IS OF POOR QUALITY

SPACE AND COMMUNICATIONS GROUP FAILURE REPORT

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	PROGRAM VAME AND NUMBER	1 MODEL 1 A TIME OBSERVED 1 DATE OBSERVED
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<u>_</u>	\$2015 5/2 (127-17: 92-25-27 SHEET USED
Z	FAILURE MALYSIS No overstress was induced. No	parts failed. All components were within
12	Spec. limits. Unit was in test configuration	
EVALUAT	opec. Limits. durit was in test configuration	
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15		MAN MET GENER COL
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Ž	A REWORK PETEST NOT REQUIRED RECAUSE	
[8	Porcet Pooleton coloction areas and retain	
ENGINEERIN	Repeat Resistor selection process and retes	<u> </u>
la		
12	21. AUTHORIZATION	La Namant 22-13 DATE 19/32 CONTINUATION
\vdash	Pa Company	TA CA SEMORY
1	ACTION TAKEN New select resistors were instal	LEG. CETERTEN SUCCESSIGNALLY
TEST	ON 6-28-82 30	1.27
a		25. CA RETEST
AND		
12	PART NUMBER CXT SYM PART LOT NUMBER DATE CODE	MANUFACTURER PROBACLE DEFECT ANALYSIS NUMBER
15	TART SQUEEZE CAT STATE COT NOMBER CATE CODE	333.03.23
CTURING	908600-256 R-18	None
Y.	908600-88 R-98	
13	908600-253 R-24	
1	'l	ETESTED BY ORG SATE E CONTINUATION
12	27. ROWORK SY C. TOWLE (GED) ORG DATE (25/2 25)	Trans for M Stando 22-13: 6-28-82 5 SMEET USED
-	30. CAUSE AND	
1	CORRECTIVE ACTION LUITIAL RESISTOR	SELECTION ALCOWED A BUILDUP
1	OF TOLERANCE TO DRIVE OFF	
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1	NO FAILURE	CLASSFICATION TL MAJOR) _ SAFETO
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i	12 KLABILLY ORG WILLIAM	Significant Supplies of Supplies
	Ta Firling 151 4/ 6-29-82	VI.12
_	873 SC _AN 80	7/2/32
31.		

·TEST DATA RECORD

, .		NOTE: VALUES ARE FROM
	6/23/82 D & MS	LISTS 52732-22(RI7-R3Z)
DATE	6/23/86 (1) \$ 1115	\$ 52732-85 (R97 -> R112)
SCANNER	FI BAND 1	

SELECT RESISTOR	VALUES	VALUE	DESIRED	ACHIEVED TOTAL
. 32nd D 908	#		(ks)	(k.s.)
17 908600 4 97	$\frac{-252.7}{-88.7}$	20.5 K'	. 20.9K	20902
R 18 -	-256 V	127.6 K	23.1	23099.
A 19. R 99	-158 / -30 /	13.7K	23.8/	53.400
72-20- 72100-	-250 V	200	19.8	16.810
√R -2 T: √R 1 0 T	-251 V	Frank "	20.1	20100
R102	SHORT V	21,5K	_21.5_	2,500
√R 23 - √R103 -	=258 =97	23.7K 499	24.2	24,99
R -24.	=254 SHORT /	21.38.	21.5	215
√R 125≔ √R 105− √R 26	= <u>>58</u> , ==76	23:7K	24.0	24,001
JR106- ✓R 27	-36V	TWO IN THE SE	- ZZ	23300
√k 10-7 √k 28'	-3587	-23.7K,	73.8	22,700
√21082 √21082	= 2567	172.6K	21.8	21.801
₩109 ₩30	= 754. = 76. = 76.	= 301 = 301	21.1	21140
\$110- √R31,	= 30 = 255		725	22512
R171.	<u>-88 v</u>	402	 ,	
VR.=3.23	- 30 /	100 Z	21.1	21,100
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SIZE CODE :DEMI MO MUMBER

A 11323 17010

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RE-SIZEETS. OPENATION 300 S SUBSTITUTED (SECOND)

DATE 6/28/82 ORIGINAL PAGE IS OF POOR QUALITY SCANNER 51065 S/NOD3 (50904-1 \$\frac{1}{2}\$)

4.2 SELECT RESISTOR VALUES

R 17 R 918 — 256 R 198 — 88 X 19 R 20 R 100 R 21 R 101 R 22 R 102 R 23 R 103 R 24 — 253 R 25 R 105 R 26 — 256 R 26 — 256 R 20 A R 27 — 258 R 28 R 108 R 28 R 108 R 28 R 108 R 28 R 108 R 28 R 108 R 28 R 108 R 28 R 108 R 28 R 108 R 28 R 108 R 28 R 108 R 28 R 108 R 28 R 108 R 28 R 108 R 28 R 108 R 28 R 108 R 28 R 108 R 28 R 108 R 28 R 108 R 29 — 257 R 30 R 30 R 30 R 30 R 30 R 30 R 30 R 30	Band	90860-	1 1	2	3	4 .
R 20 R100 R 21 R101 R 22 R102 R 23 R103, R103, R104-88 R104-88 R25 R105 R 25-256 R26-256 R27-258 R106-30 R-27-258 R107-30 R-27-258 R108 R108 R108 R108 R108 R109-97 R30 R110 R331-255 RTITE 2076 3012 C. A 200-2	R 97 R 98 R 98 R 19	— 256 — 88				
R 23 R103 Re24-253 R104-88 R104-88 R25 R105 R 26-256 R 26-256 R 27-258 R107-30 R-27-258 R108 R108 R108 R108 R109-97 R30 R110 R231-255 R110 R231-255 R110 R231-255 R110 R231-255 R110 R231-255 R110 R231-255 R110 R231-255 R110 R231-255 R110 R231-255 R110 R231-255 R110 R231-255 R110 R231-255 R110 R231-255 R110 R231-255 R110 R231-255 R110 R231-255 R110 R231-255 R110 R231-255 R110 R231-255 R110 R231-255 R110 R231-255 R110 R231-255 R110 R231-255 R110 R231-255 R110 R231-255 R110 R231-255 R110 R231-255 R110 R231-255 R110 R231-255 R110 R231-255 R110 R231-255 R110 R231-255 R110 R30-25-25-25-25-25-25-25-25-25-25-25-25-25-	R 20 R100 R 21 R101 R 22					
R 26-256 R106-30 R=27-258 R107-30 R 28 R108 R108 R109-97 R30 R110 R231-255 RTTT 2076 Shales C. f. Lene 06-28-82 MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN MALALAN	R 23 R103 Re24- R104- R 25					
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4.2	Offset Volta	ge	Measurements	after	Select	Resistors
	Installed.					

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10	-3.99	-		
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14	-4.12			
15	-4.06			
16	0/ -20.82-			
Technician.	Office - 25 of -	Date	6-28	'-87
QA _	Miller	Date	4.28-8	-2 /1
REA _	Shahar	Date	6-28	-82

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SPACE AND COMMUNICATIONS GROUP

FAILURE REPORT CONTINUATION SHEET

PR SEZIAL NO. S 8464 CONTINUATION SHEET LITTER®

	*LABEL FIRST CONTINUATION SHEET USED 'A', SECOND 'B', AND SO	ON	ADDITIONAL FR	
	IDENTIFY ENTRIES BY REFERENCING FR BLOCK NUMBER IN COLUMN, DATE I	EACH ENTRY.	CONTINUATION SHEET(S) USED	
26	PT. No. CIRCUIT SYMBOL		Li DIFECT	
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 !	908600-258 27	<u> </u>	11	
\sqcup	908600-30 P107		(1	
	908600-251 R29		(1	
:	908600-97 R109		įt	
,	90860-255 R31		1.1	
	908 600 -111 R-76			
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DATA RECORD

NOTE: VALUES ARE FRO 6/23/82 D & MS LISTS 52732-22(RI7-R32) SCANNER F1 BAND

SELECT RESI	STOR VALUES	\$	YALUE	DESIRED	ACHIEVE TOTAL
Band (1)	908 #			(k s.)	(K.A.)
	600 -25		20.5 K'		20902
水 9.7		38_/ /,	.402" 22.6 K	23.1	23099
12 98°	<u>-9</u> -25	 ,	<u> 199 -</u> 23.7 K	23.8/	23500
R 99 - 20-	3 _25		100 K	19.8	19.810
R100- R 721-	<u>-5</u>	9 / 3	200 200K w	20.1	20100
√R 1'0 1 → √R = 2'2'	-35	Q V	71.5K	21.5	2,500
R102 √R 23 →	SH01 = 25		23.7*	24.2	24199
√R103 / √R-24.	<u>-9</u>	7_/	311. 2 K	215	21.5
R104 JR:25:-	- 2 S		2.3.7K	24.0	24001
R105			3012 3012	22.7	22700
/R106=			-100 -23.7K	738	23.300
√R10-7 √R 28*-	-3	0 1	1000 3 3 3 3 5 5 5 5 5 5 5 5 5 5 5 5 5 5	22.7'	22,700
√R108≈ √R 29			~21:5K"	21 8	21.801
JR 109 JR 30		76 ×	-301 -27/0 K	21.1	21100
v2110≈ √R::-31:		30-1	100	7251	22512
R17:1.			402		
√R.=3.2; √R.=1.10==	<u>- 2:</u>		100 ?	21.8	21,100
1/c-12190		<u> </u>			

CD0E 10EHT HQ 11323 17010 А SCALE 250 SHEET 4 of 4

4.2

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4.2	SELECT RESIS	TOR VALUES		•				
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	2 97 Roll - 256							
	R 49.80- 86	22.4 402					 .	
	R 19 R 99				3			
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	R103 /	· · · · · · · · · · · · · · · · · · ·					· · ·	
	B ₁₀ 24-253 M104-88	21.0	<u> </u>	· · · · · · · · · · · · · · · · · · ·				
	R 25 R105			·				
•	R 25-256	22.6					·	
	R106-30 R-27-258	100 x 23.7	<u> </u>	•				·.
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	R108				. ————			
	RU29—251 R109–97	20.0	<u> </u>	·		- , 		
1	R 30 R110							
*1	1831-255	1.55	K _					
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			SCALE	REY	4	SHEET 4	of 5	
1127-1-A 13-4FF DICIES	CH-POST CLEASPEINT 1000	11	A		·			

4.2 Offset Voltage Measurements after Select Resistors Installed.

Band	1	2	3	4
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13 '			•	
14	-4.12			•
15	<u>-4.06</u>			
16 Ch	1 -00-25-87-			
Technician	Shahar	- Date	6-28	- 87
QA Z	Wilm	Date	4.28-8	-2 (\$)
REA	SI	Date	4-2 B -	0
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REF FR#8464 Test Ver Lichian Supp#15 operation 4900 (32)

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SECTION 2.13
CABLE HARNESS

2.13.1 Cable Harness

2.13.1.1

No performance data was taken at the subsystem level on this subsystem.

2.13.2 Acceptance Data

2.13.2.1

ORIGINAL PAGE IS OF POOR QUALITY

2.13.2.1
Configuration Lists



R=RECORD CHANGE

CABLE ROUTING ASSY 52348 (3569647) S/NO05

LVL	PART NO.	NOMENCLATURE	CURRENT ACCEPT. REVISION REVISION	AS-BUILT SERIAL REVISOON NUMBER
01	52348	CABLE ROUTING ASSY	F F 3844A 3844A	F 005
01	3569647	WIRING HARNESS INSTALLATION	c c	C 005
			27724 27724 70534 70534 70538 70538 70543 70543 70550 70550 70561 70561	27724 70534 70538 70543 70550 70561
02	3569641	WIRING HARNESS	E E	E 005
			27722 27722 27723 27723 D042 REV1 D042 REV1 D057 D057 D060 D060 D062 D062 D063 D063	27722 27723 D042 REV1 D057 D060 D062 D063
03	DP50326	DPS ASSY OF AMP CONNECTORS	SCN 1 SCN 1 2 2 3 3 4 4	SCN 1 POOR 2 3 4
) 2	3569642	WIRE, JUMPER -	9494 9494	PAGE IS
)2	3569643	CONNECTOR	D064 D064	D064

52348(3569647) S/NOO5

	•	22340 (1700000)					
IND	PART NO.	NOHENCLATURE	CURRENT REVISION	ACCEPT. REVISION	AS-BUILT REVISION	SERTAL NUMBER	
0.0	05/0///		_				
02	3569646	WIRING DIAGRAM	В	В	В		
	••		27727	27727	27727		
			27732 R70552	27732	27732 70552		
			70557	70557	70557		
			70564	70564	70564		
			70567	70567	70567		
1			70507	, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		10.5	
02	3569649	RF BACKSHELL	_	_	_		
				:		85	
02	3449442	EYELET	• 1	-	_		
02	ICL3569638-1	INTERCONNECT LIST	A	A	A .		
			27721	27721	27721		
			27726	27726	27726		
			27735	27735	27735		
			27737	27737	27737		
0.2	TP32015-036-1	TP GF ELECTRICAL			• • • • • • • • • • • • • • • • • • • •		
02	1132013-030-1	WIRING HARNESS	A	A	A		
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02	52349	STRUCTURF ASSY-ELECT.	· · · · C	. C	C -	ି କ୍ଲିଲ	
			1987A	1987A	1987A	<u> </u>	
0 2	52361	GASKET, CONNECTOR	A	A	. A	₹ 78	
			8151	8151	8151		
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02	52365	PLATE, CONNECTOR-RIU	A	A	A		
*			1961A	1961A	1961A		
			3275A	3275A	3275A		
0 2	52366	PLATE CONNECTOR		*	A		
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Ar Nn	PART NO.		·	NOMENCLATURE	CURRENT REVISION	ACCEPT. REVISION	AS-BUILT REVISION	SERIA NUMBE
)2	52839			CONNECTOR, RECEPTACLE	D 2087A 2748A	D 2087A 2748A	D 2087A 2748A	
) 2	52930			CAP & RELAY BD ASSY	E 2977A 3807A	E 2977A - 3807A	E 2977A 3807A	.202
0 2	53160		ı	TERMINAL BD ASSY	В	В	В	201
0 2	53653			PLATE, FILTER MOUNT	A	A	A	
02	53710		· .	TERMINAL BD POWER	C 3255A	C 3255A	C 3255A	
0 2	53711			PLATE, POWER SUPPLY	A	A		
0 2	53927			GROMMET, PLASTIC EDGE	A .	A	A	
02	52923			TERMINAL BD ASSY	B 9369	В 9369	9369	201
02	54012	•		HEATER ASSY	A 2398A	A 2398A	A 2398A	201
0 2	54185			RETAINER, CABLE	A 1886A	A 1886A	A 1886A	
02	54233-1			SW THERMOSTAT ASSY	A 3504A	A 3504A	A 3504A	202
02	54257			+/-2 SMA CONTROL RES	A 2925A	A 2925A	A 2925A	203
02	653307			TERMINAL LUC, SOLDER			-	
02	16268			PS FOR SURFACE MOUNTED COMPONENTS	A 2216A 2940A 3080A	A 2216A 2940A 3080A	A 2216A 2940A 3080A	ORIGINAL OF POOR
Ell	Mour	<u>.</u> :	·		3283A	3283A	3283A	PAGE IS QUALITY

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HARNESS

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P/N 52348

FLIGHT

Failure R	eports Number
Open	Closed
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Deviation	Waivers				

HARNESS

P/N 52348

FLIGHT Failure Report No.		Failur	OFLIGHT re Report No.	ENGINEER Failure Report No.		
	Open	Closed	Open	Closed	Open	Closed
	Open	Closed			Open	Closed

Listing of Liens

There were no liens recorded against the Harness Assembly.

END D)/4/7/13 FILMED

AUG 5 1983